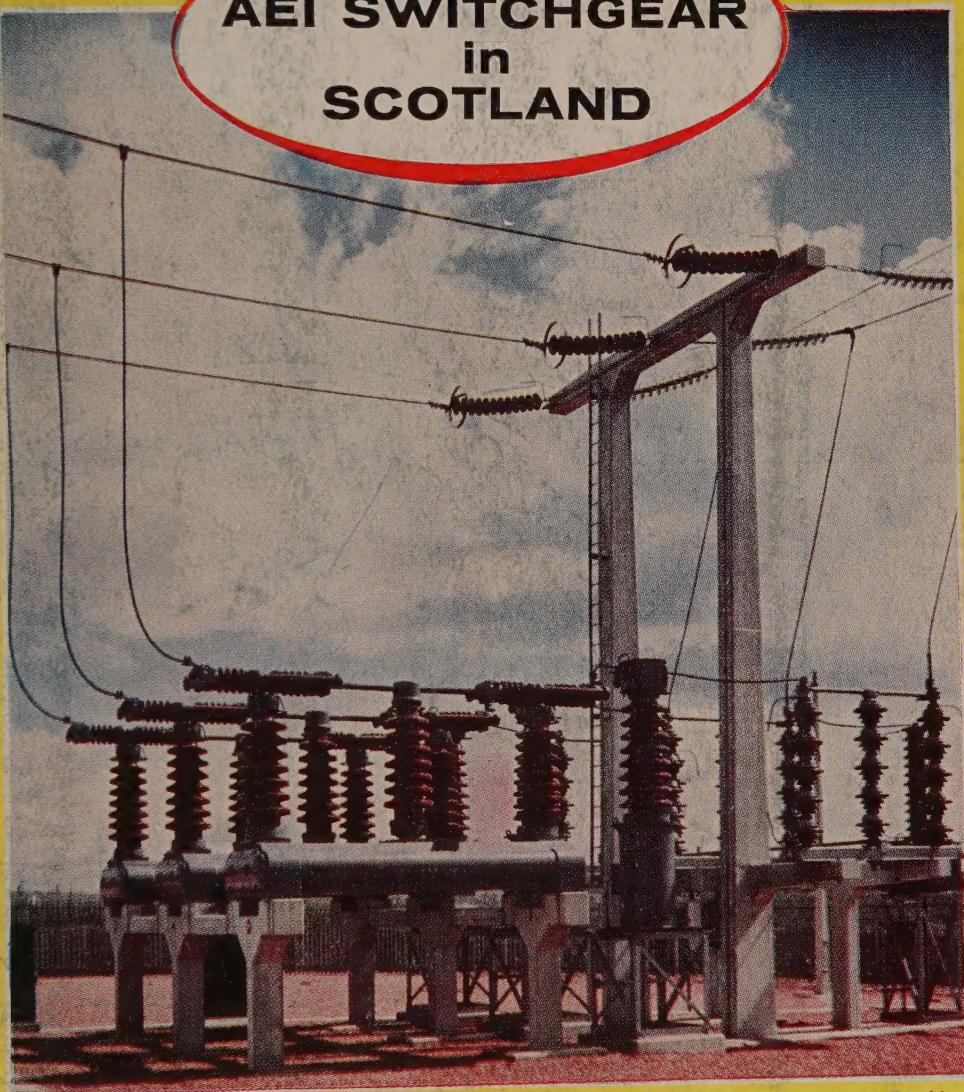


# 4 ELECTRICAL REVIEW

FRIDAY  
21 OCTOBER 1960WEEKLY  
PRICE 1s 6d

**AEI SWITCHGEAR**  
in  
**SCOTLAND**



Photograph by courtesy of South of Scotland Electricity Board. Consultants: Messrs. Kennedy & Donkin.

This twelve-switch, outdoor switching station at Neilston, Renfrewshire (South of Scotland Electricity Board) is equipped with air-blast circuit-breakers of the type GA6W4, with a rating of 132 kV—3500 MVA, manufactured by AEI. Two further circuit-breakers of the same type are to be added. These will control the 132 kV side of the two added 'Supergrid' transformers which will be installed in the

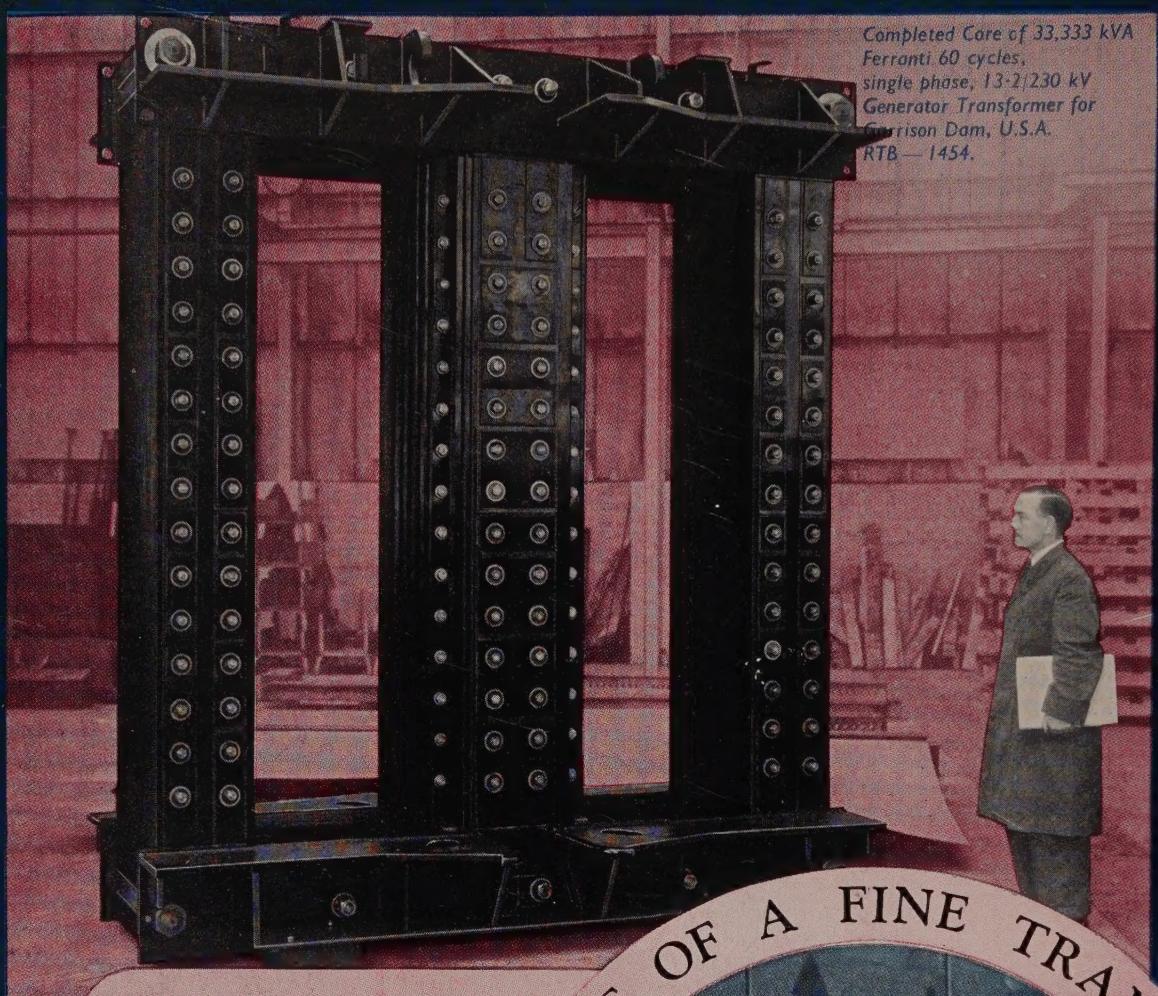
adjacent 275 kV Sub-station. In addition, outdoor current-transformers and extensions for the existing control and relay boards will be supplied. The generating station at Kincardine-on-Forth is similarly equipped with AEI switchgear, to the order of the South of Scotland Electricity Board. These installations will link up with the projected 275 kV scheme in South Scotland.

For further details, write to AEI Switchgear Division, Trafford Park, Manchester, 17 or to your local AEI Office.

**Associated Electrical Industries Ltd.  
Switchgear Division**

TRAFFORD PARK, MANCHESTER · HIGHER OPENSHAW, MANCHESTER · WILLESDEN, LONDON

F/A 013



Completed Core of 33,333 kVA  
Ferranti 60 cycles,  
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Generator Transformer for  
Garrison Dam, U.S.A.  
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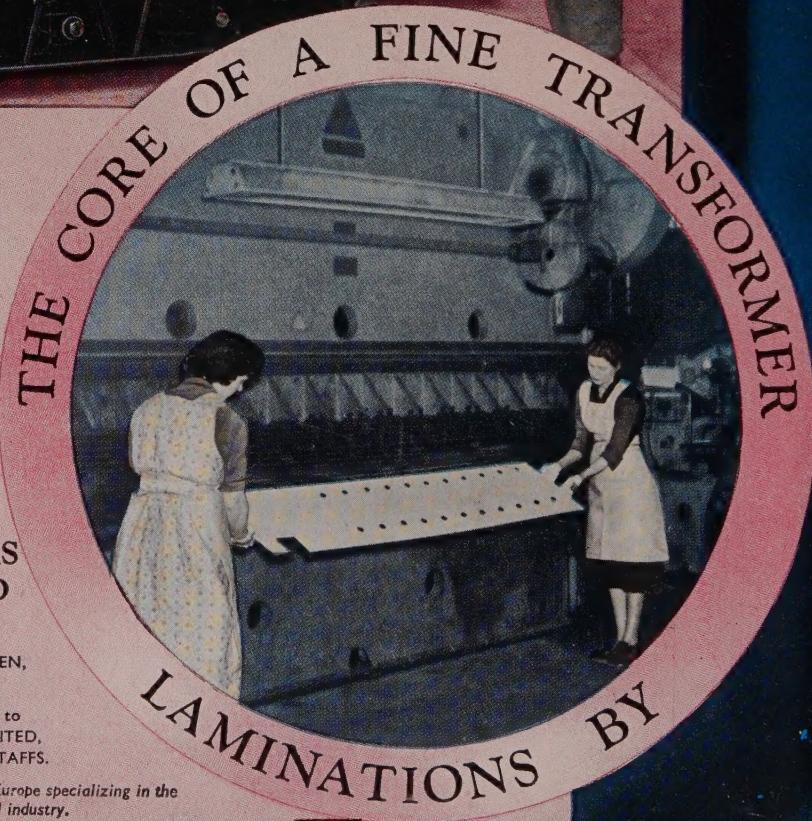
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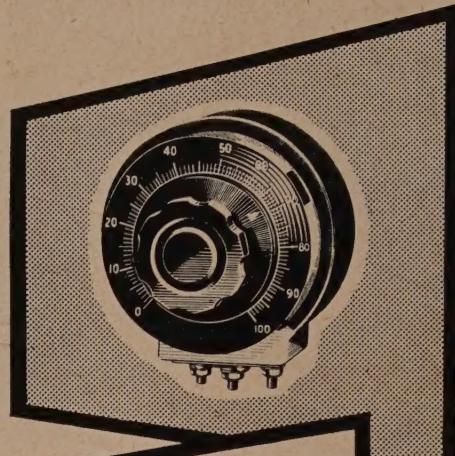
A MEMBER OF THE METAL INDUSTRIES GROUP OF COMPANIES

# Better make it

# Birch

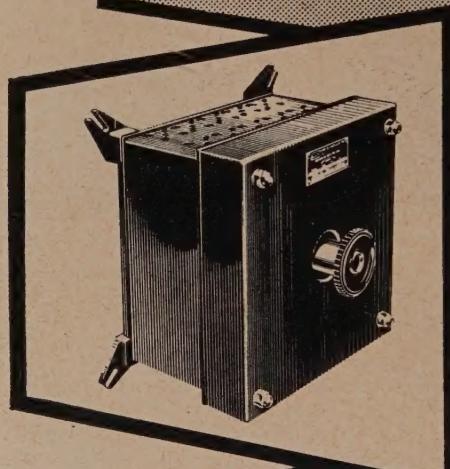
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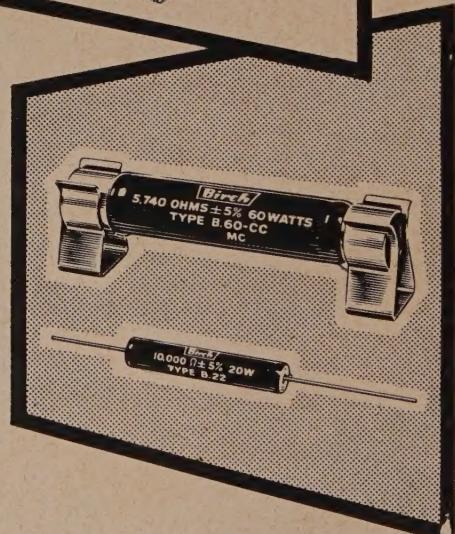


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ENAMELLED  
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Fully vitrified porcelain former winding  
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liberal safety margin and tolerance.

WIRE END TYPE 7 SIZES—1½ to 30 WATT  
Axial or Radial leads, tinned, securely  
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the weight of the resistor, which can  
therefore be soldered in to equipment.  
Write for list No. 190.



# Birch

# make it better

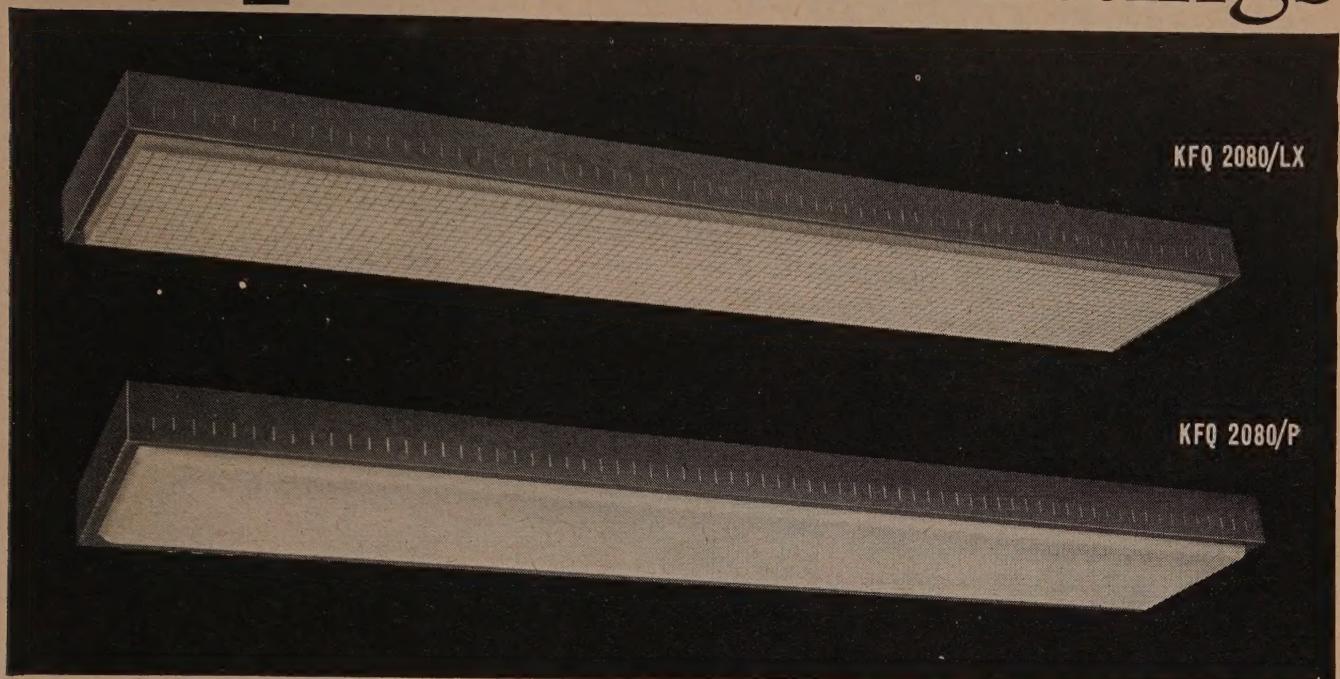
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# 4 new atlas fittings

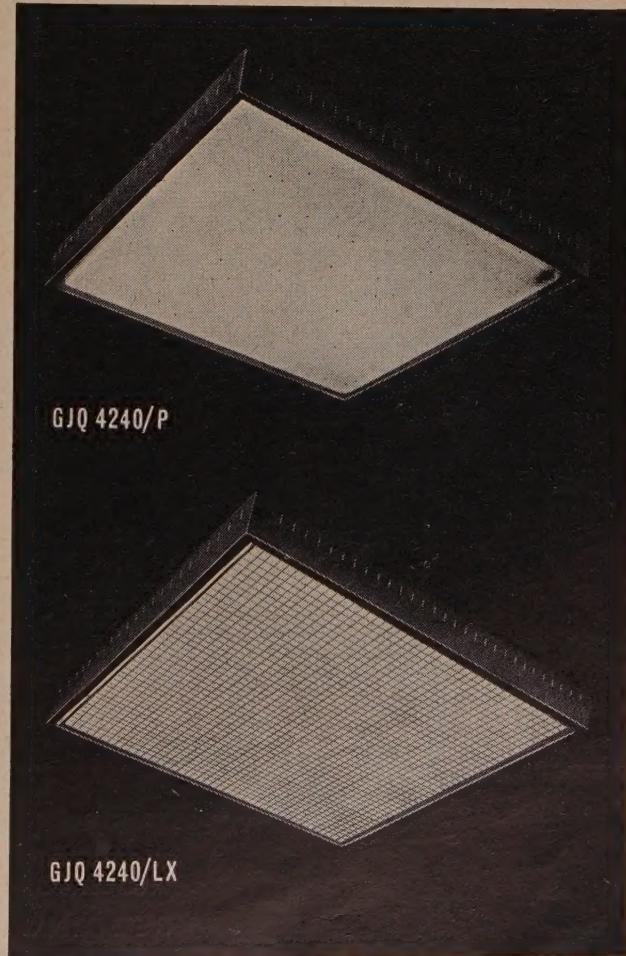


## for commercial lighting

These latest additions to the Atlas KE and GJ ranges of fluorescent fittings are specially designed for use in offices and stores, where both decorative effect and efficiency must be of a high order. They provide wide scope for variation in ceiling layout, and incorporate many unique features for extreme ease of installation and servicing.

**KFQ/2080/P and /LX** are based on a simple batten fitting, with an extremely neat section, and house two 5ft. 80w. tubes with quick-start control gear. Spring-loaded lampholders facilitate fast re-lamping. The metal frame of both fittings is finished in mushroom grey, and slotted on all four sides. The type P incorporates an opal 'Perspex' dish, and the type LX has a Louverex diffuser.

**GJQ/4240/P and /LX** are slim 'wafer' fittings, square in shape (28" x 28"), for surface mounting. They incorporate four 2ft. 40w. tubes and quick-start control gear. The type P has an attractive single-piece 'Perspex' diffuser, fitting neatly into a mushroom grey metal frame, slotted to give an added degree of sparkle. The type LX also incorporates the slotted frame, with a 'Louverex' diffuser giving a greater concentration of downward light.



**ATLAS LIGHTING LIMITED,**  
A subsidiary company of *Thorn Electrical Industries Ltd.*  
Thorn House, Upper St.Martin's Lane, London, WC2

# The NEW range of— “MEMREX-EXEL” 500 volt Switchgear

**PRESSED STEEL ENCLOSURES  
FOR LIGHTNESS AND STRENGTH.  
FRONT OPERATING SWITCH HANDLES.  
REWIRABLE OR H.R.C.  
10—15—30 Amp. Switches  
10—15—30—60 Amp. Switchfuses.**

This new range of “Memrex-Exel” switchgear provides the most up-to-date and technically advanced range of 500 volt industrial switchgear yet offered to industry.

Modern styling, sound technical performance and compliance with all relevant British Standard Specifications are basic essentials. The range complies with the most strict interpretation of I.E.E. Regulations (13th edition), and with the requirements of The Electricity (Factories Act) Special Regulations.

#### **Features include**

Cases of one piece pressed steel with hinged covers, rustproofed and finished light grey stove enamel.

Front operating switch handles improve appearance and permit more compact assemblies on switchboard and panels.

Fuses are of the new “Kantark-Exel” pattern which will accept rewirable or H.R.C. fuses. Semi-enclosed rewirable (damper type) patterns comply with B.S.3036 : 1958.

H.R.C. cartridge patterns which are interchangeable with semi-enclosed rewirable patterns, comply with B.S.88:1952, Appendix ‘J’ Dimensions.

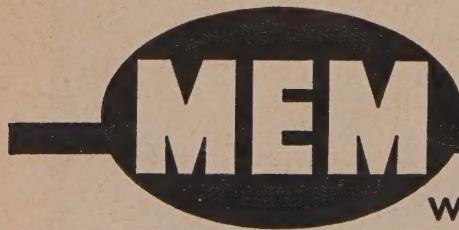
M.E.M. H.R.C. cartridge fuse carriers are designed to accommodate H.R.C. cartridge fuse-links made to B.S.88 : 1952, Appendix ‘J’ Dimensions, Form A—Offset Tags.

M.E.M. H.R.C. cartridge fuse-links are available for use with this range of switchgear. All ratings have been A.S.T.A. certified for Categories of Duty 440 A.C.3 (16,500 amps), 440 A.C.4 (33,000 amps.) and 440 A.C.5 (46,000 amps.).



“Memrex-Exel” switches comply with the relevant Temperature Rise and Making and Breaking Capacity Tests of B.S.861: 1955 and B.S.2510: 1954.

*All these and many other features.*



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**Associated Electrical Industries Limited  
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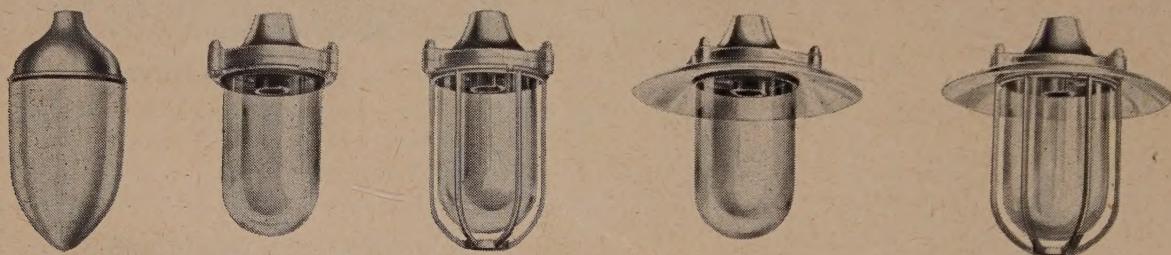
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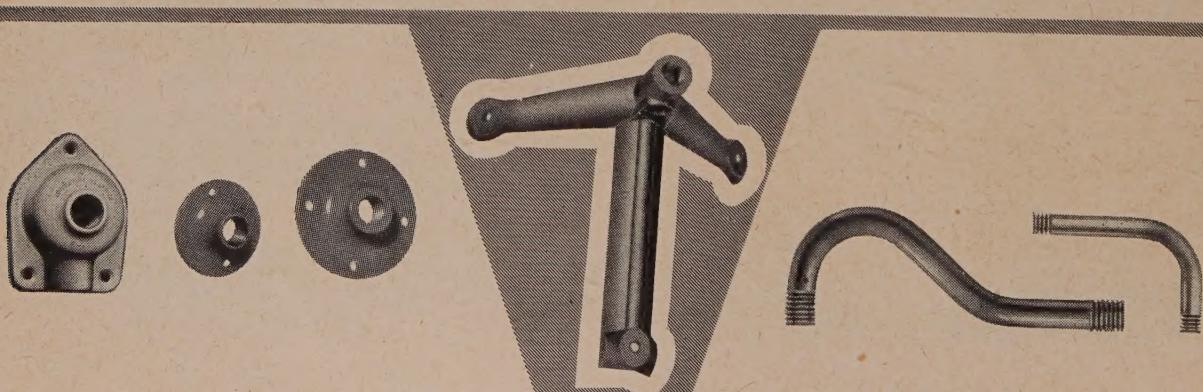
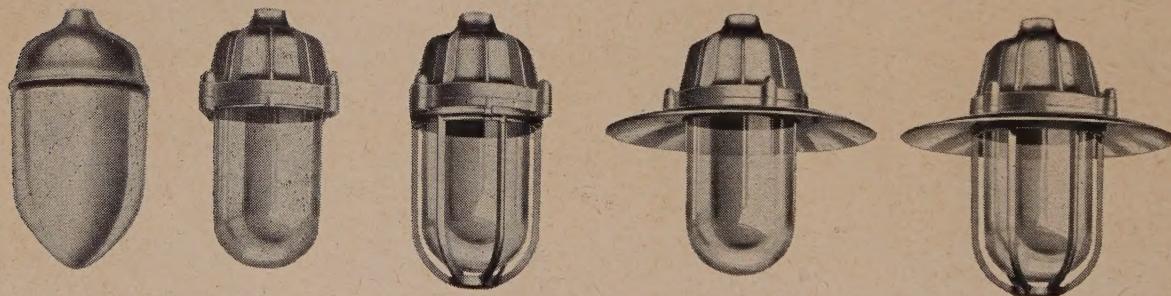
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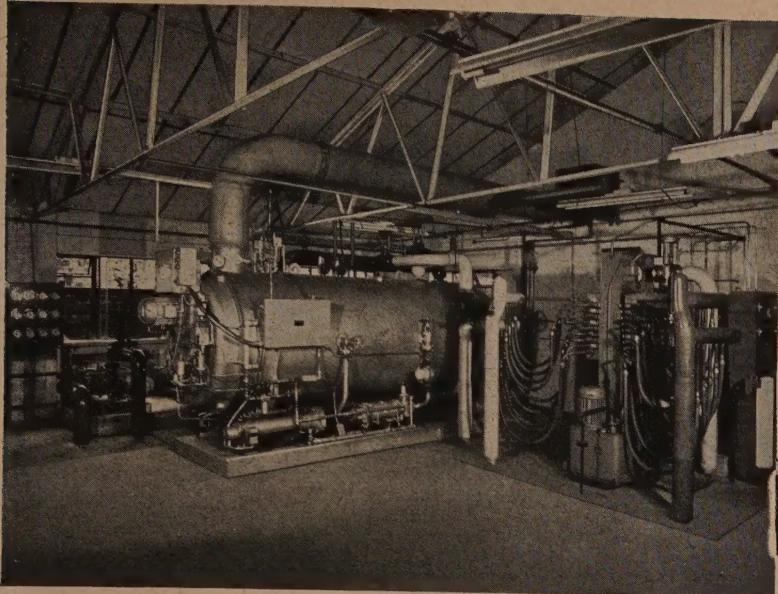


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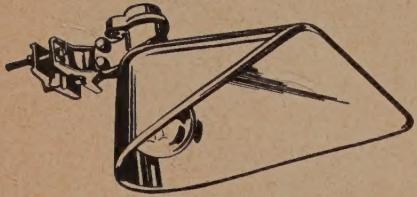
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*Our publication U4201 gives particulars*

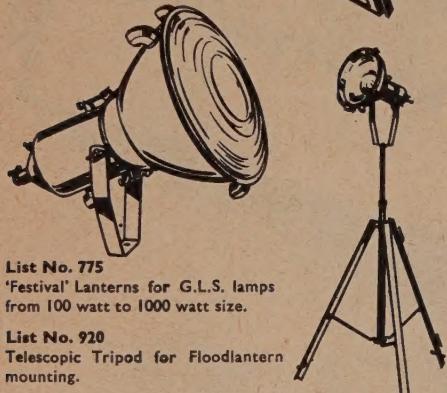
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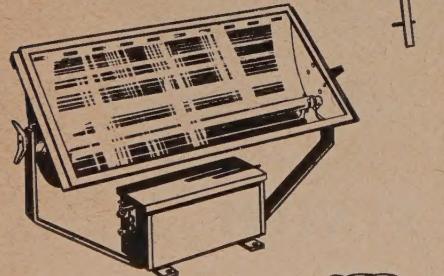


List No. 940  
Downward lighting Sodium Lantern for wall or Pole mounting.



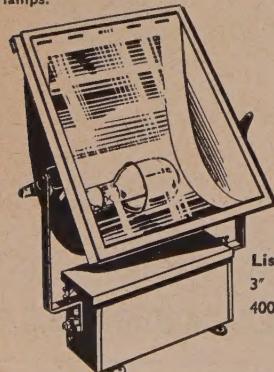
List No. 775  
'Festival' Lanterns for G.L.S. lamps from 100 watt to 1000 watt size.

List No. 920  
Telescopic Tripod for Floodlantern mounting.



List No. 942  
Upward lighting Lantern for 200 watt Sodium lamp.

List No. 568  
Narrow beam Projectors for 500 watt to 1,500 watt G.L.S. lamps.



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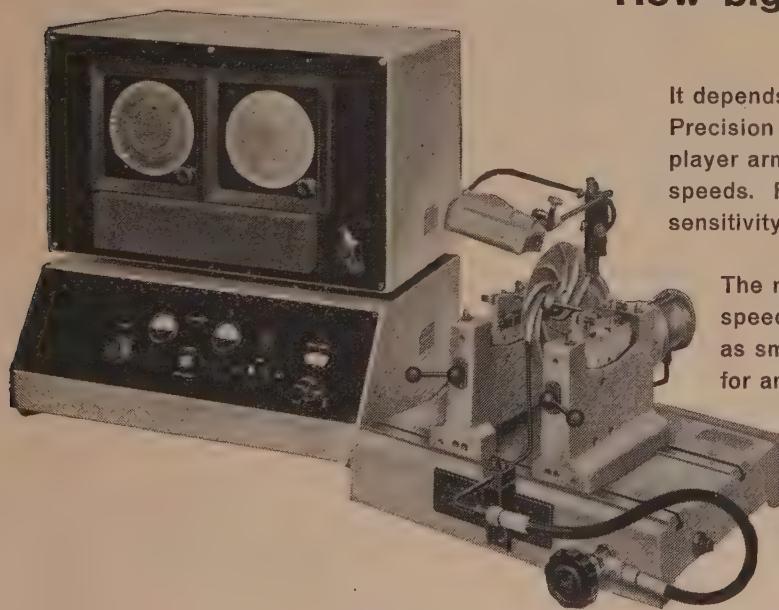
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# 1912-1960 THE STORY OF BELLING & COMPANY LIMITED

No. 38 OCTOBER 1960

## *Half-Yearly Report of the Governing Director*

At this half-way stage in our trading year, I am glad to report that despite all the adverse factors we know of and also read about, we ourselves have been kept pretty busy. Our cookers have been selling well, in fact beyond our capacity to deliver in some cases, with the No. 47 model still highly popular and the No. 48T model now firmly established. Both these cookers are great favourites with those who install them and also with those who use them.

To these models we have now added our four-plate No. 60 and our four-plate horizontal No. 70 cookers, which are now coming into quantity production. Both these cookers will, I am sure, soon become best-sellers in their respective fields.

On the heating side of our business our Burnley Works have been very fully occupied with the manufacture of fires and convectors for sale in the heating season just commencing and we feel we can look forward to a healthy volume of orders, with rapid deliveries on our part from our stock.

Turning to figures for a moment, we are now some 22% ahead of last year's sales, but not, as yet, up to our target. Our profit margin tends to contract however with certain of our purchases and other expenses rising, but we may yet redress this tendency by the development of further internal efficiencies.

However, I am glad to be able to pay the same interim share of the profits to our employees as last year. The final distribution, naturally enough, depends on how things go in the next six months. We feel business will be good and with increased sales and increased efficiency at both of our Works, I hope it will be possible for us to maintain the final share out of profit at the same level as last year.

Our building programme is still forging ahead and our new big extension at Enfield is

nearly completed and already partly occupied. An additional building at Enfield is already approved and construction will shortly commence. These two buildings alone will give us a further 100,000 sq. ft. of productive space. Then our third extension at Burnley is well under way, the levelling and foundations being almost complete. This will give us yet another 100,000 sq. ft. which should be available for production in early 1961.

So much for our Works side . . .

Now about Sales. Well, our latest catalogue is now in full circulation and the demand for it is very big; we shall be very pleased to forward any further quantities you would like upon hearing from you. I would like to emphasize that we are offering today a truly comprehensive range of heating and cooking appliances and your customers will assuredly find something to meet their individual requirements from the variety of designs and sizes we are producing. It is true to say that there is today a greater interest than ever before in the real benefit of adequate heating of the home. The wonderful selection of Belling Electric Fires and Convectors which we have available will, I feel sure, help to meet the growing demand for clean, fast and efficient electric heating, which avoids the upset of major installation work of a costly nature.

The Belling range of Electric Cookers also represents a remarkable variety of size to meet every purse and every purpose. All are beautifully designed, all are eminently practical, and all are well-made and finished. They are today's best value in cookers, the most important item in any kitchen.

We do look forward, therefore, to continuing to receive a good share of your fire and cooker orders and we, on our part, shall endeavour to give an all-round improvement in delivery and service.

*Belling*



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That distance, whether it be governed by steel bars or wire mesh, can represent the difference between safety and serious injury. Machinery and tools—often running at high speeds—can be as productive of danger as any wild animal; and it is only good sense to cut this risk by using efficient and properly designed guards and fencing.

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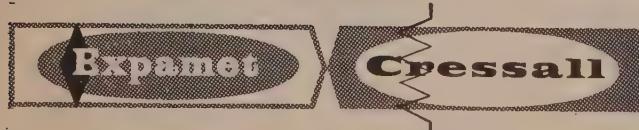
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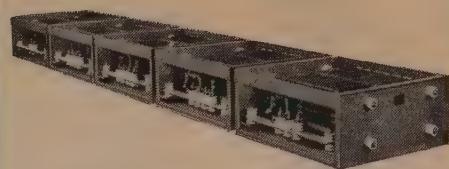
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Main Starting Resistors



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 Expanded Metal resistors

Starting Resistors



Edgemet—Heavy Duty  
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Signal Equipment



Vitreous  
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 resistors

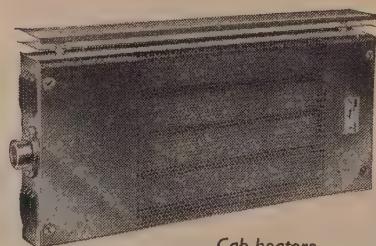


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Toroidally wound  
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## **Voltmeters & Ammeters**

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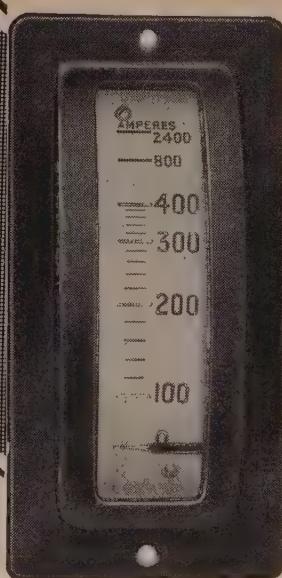
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TWO 13 AMP 3 PIN  
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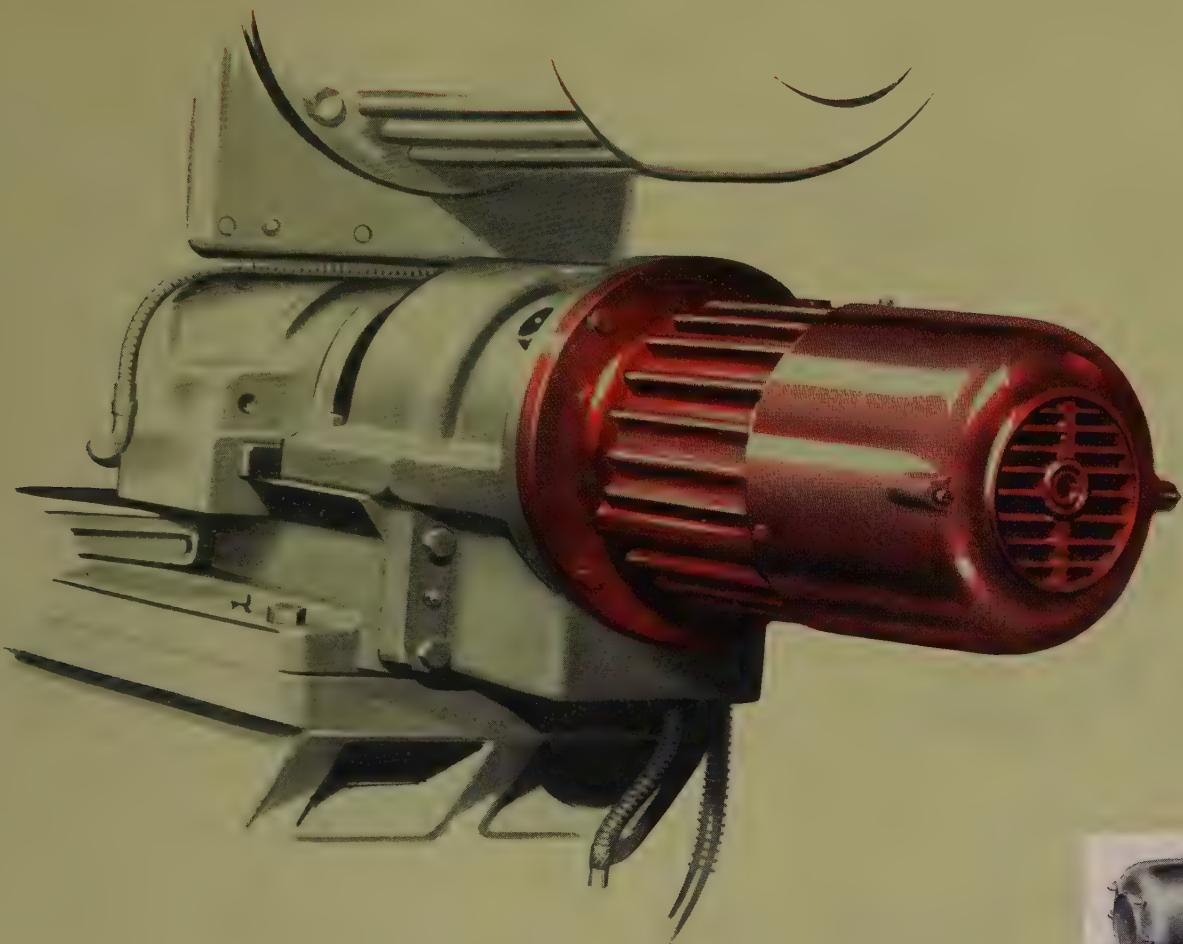


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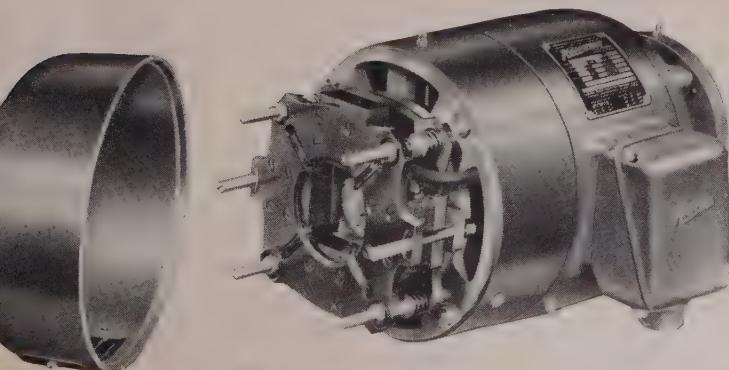
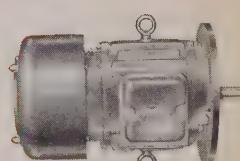
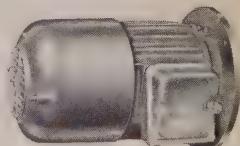
N° 5

## Brake motors

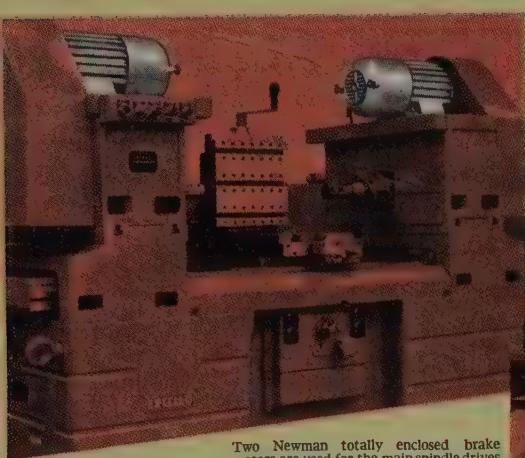
Newman electro-magnetic disc brakes can be specified for any three-phase motor in the fhp, totally enclosed and drip-proof ranges up to 40 hp, two-pole. There are seven sizes of brake available covering a total torque range of 3-120 lbs.ft. (a range of torque values is possible for each horsepower/frame size of motor so that, within limits, the retarding torque can be matched to the needs of the application rather than the speed or hp of the motor). The brakes are remarkably compact, powerful and efficient and the motors themselves are standard in every respect apart from the end brackets and shaft extension at the non-drive end where the brake is mounted. The brakes operate from the normal A.C. supply and are of the "fail to safety" type.

Here is a selection of the types of Newman Brake motor currently in production. However, any Newman motor (drip-proof or totally enclosed) from fhp - 40 hp, (two-pole), foot, flange or face mounting can be equipped with the brakes.

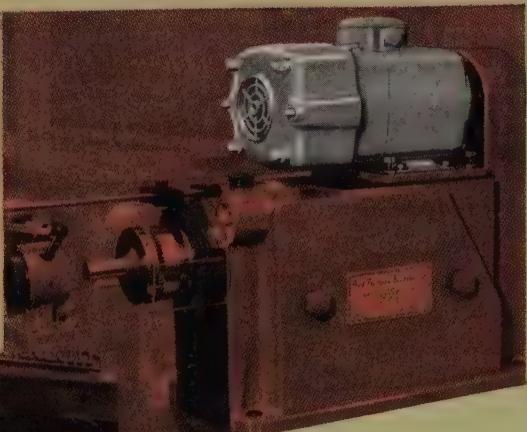
1. Drip-proof, flange mounted.
2. Totally enclosed, face mounted (with special hand operated manual release screws).
3. Totally enclosed, flange mounted.
4. Totally enclosed, flange mounted (special oversize brake for extra high torque).

# Brake motors at work



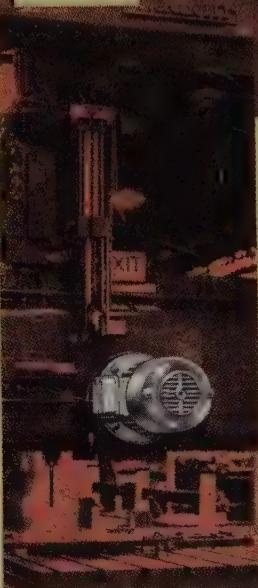
Two Newman totally enclosed brake motors are used for the main spindle drives on this Style 17 senior double-ended precision boring machine, manufactured by Ex-Cell-O Corporation (Machine Tools) Ltd.



This is a Fine Boring Unit Head manufactured by High Precision Equipment Limited. The Newman 'ELF' fractional horsepower brake motor controls the boring spindle.



Above—Both motors on this Kitchen & Wade horizontal drilling machine are Newman. The lower one is the brake motor—a 2 hp totally enclosed, used for the head traverse.



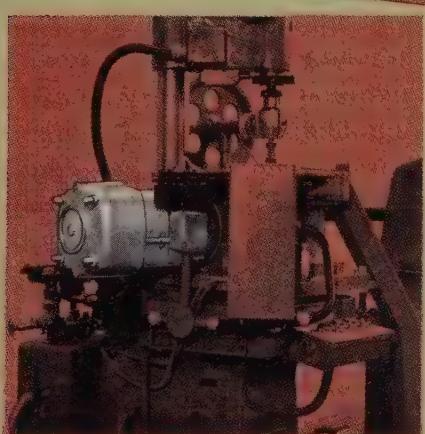
Right—The main drive on this Brooke Tool Unit Head is by a standard Newman totally enclosed motor; the traverse motion is controlled by a Newman 'ELF' fractional horsepower brake motor.



Wadkin Tape Controlled Drilling Machine, Model T.C.D., fitted with a Newman 3 hp totally enclosed brake motor for operating the raise and lower movement of the beam.



This 10 cwt. Felco hoist is powered by a 3 hp Newman totally enclosed brake motor.



Right—A Flong Embossing machine manufactured by R. W. Crabtree & Sons Ltd., of Leeds, and used in the printing industry—powered by a Newman 5 hp drip-proof brake motor.



Left—The automatic indexing and precise positioning of the work stations on this Felt tape machine is controlled by a Newman totally enclosed, 'ELF' fractional horsepower, brake motor. In this instance the entire cycle of the machine relies upon the consistency of the braking to within plus or minus one revolution of the motor.

ELECTRIC MOTORS TO 600 h.p.

**Newman**

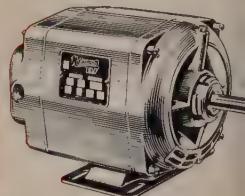
NEWMAN INDUSTRIES LIMITED - YATE - BRISTOL - ENGLAND

Telephone: Chipping Sodbury 3311. Telex: 44121. Telegrams and Cables: Dynamo Yate.

605 Cogent

## THE NEWMAN RANGE

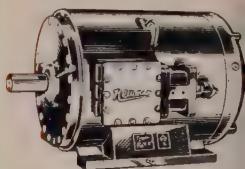
Some of the other types  
of motors available



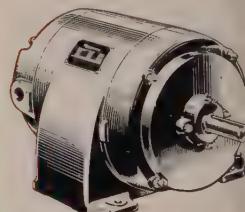
'ELF' FRACTIONAL H.P.  
MOTORS  
British Standards,  
NEMA Dimensions,  
1/16-1 h.p. (List No. 501).



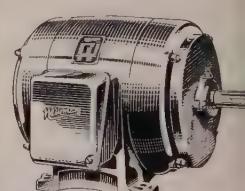
TOTALLY ENCLOSED  
MOTORS  
with Double Air Circuit  
Cooling.  
British or American Standards,  
NEMA Dimensions,  
25-250 h.p. (List No. 305).



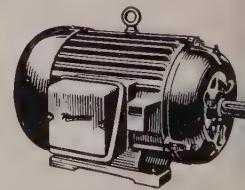
FLAMEPROOF MOTORS  
STEEL FRAME  
(Buxton Certified)  
British Standards.  
5-200 h.p. (List No. 702).  
(Also available to NEMA  
Dimensions).



DRIP-PROOF SINGLE-  
PHASE MOTORS  
British or American Standards  
New NEMA Dimensions,  
1-5 h.p. (List No. 105).



DRIP-PROOF THREE-  
PHASE MOTORS  
British Standards,  
1/175 h.p. (List No. 101).  
New NEMA Dimensions,  
1/150 h.p. (List No. 102).



TOTALLY ENCLOSED  
THREE-PHASE MOTORS  
British Standard Dimensions  
1/60 h.p.  
(List No. 301).  
New NEMA Dimensions,  
1/60 h.p.  
(List No. 302).

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PUBLICATION NO. PCU. 1  
APRIL 1960

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Publication No. SCT. 2  
April 1960

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SIZE	STRAIGHT ELBOWS	CONVEX BENDS	CONCAVE BENDS
1/2 in.	12.0	12.0	12.0
5/8 in.	12.0	12.0	12.0
3/4 in.	12.0	12.0	12.0
1 in.	12.0	12.0	12.0
1 1/4 in.	12.0	12.0	12.0
1 1/2 in.	12.0	12.0	12.0
2 in.	12.0	12.0	12.0
2 1/2 in.	12.0	12.0	12.0
3 in.	12.0	12.0	12.0
4 in.	12.0	12.0	12.0
5 in.	12.0	12.0	12.0
6 in.	12.0	12.0	12.0
8 in.	12.0	12.0	12.0
10 in.	12.0	12.0	12.0
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84 in.	12.0	12.0	12.0
96 in.	12.0	12.0	12.0
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2904 in.	12.0	12.0	12.0
2916 in.	12.0	12.0	12.0
2928 in.	12.0	12.0	



# DURIUM

Registered Trade Mark

## The world's FASTEST masonry drill

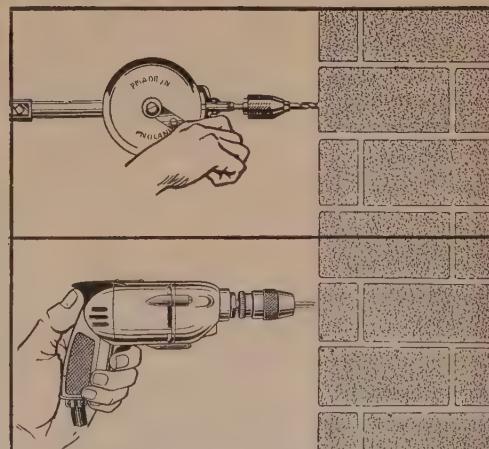
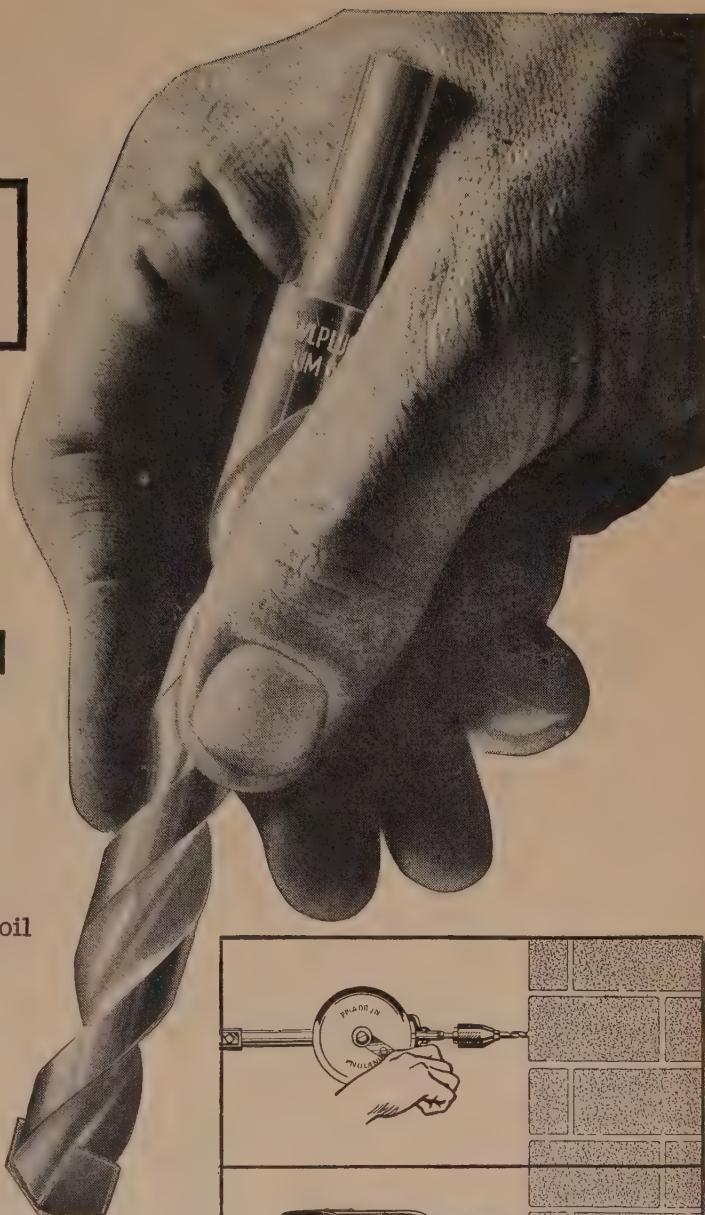
DURIUM is the drill that revolutionized masonry drilling, staggering the industrial user with its amazing speed of penetration and sharp, silent, easy-cutting accuracy! With its tough, almost diamond-hard Durium tip, and its patented rapid-helix flute to force out spoil and prevent clogging, the Durium Drill penetrates masonry of all kinds at a speed unequalled anywhere in the world.

### and the most durable

Just as important to your costs is the extraordinary durability of Durium Drills. Remember that masonry is an abrasive material which quickly ruins ordinary drills. The astonishing toughness of the Durium tip, and the stronger backing of steel given it by the specially designed flute, makes Durium Drills the world's most durable masonry drill.

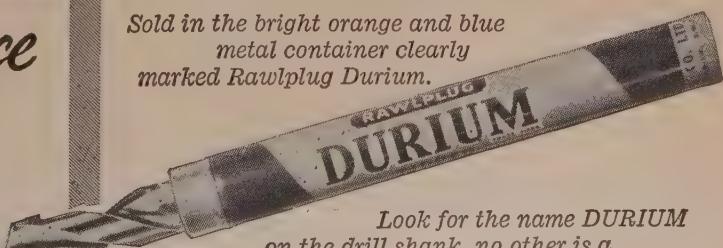
### Free resharpening service

When, at long last, your Durium Drill begins to lose its keenness, return it to us with the address labels supplied with it, and we'll re-sharpen it FREE! Write now for full details of these fastest-of-all masonry drills.



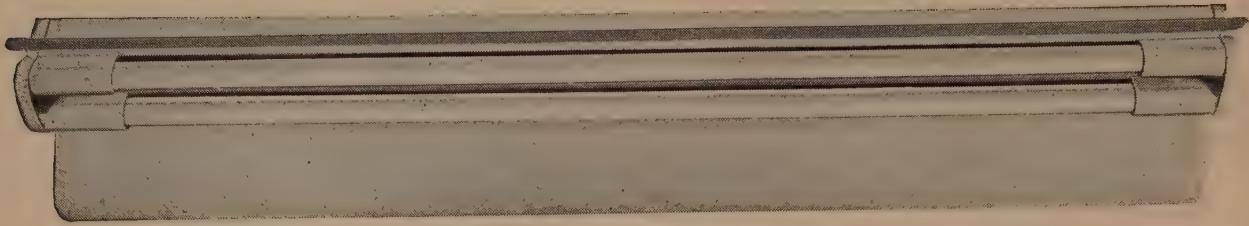
The R P.2. two-speed Electric Drill (with the keyless chuck) is the ideal power tool for use with Durium Drills. With a full load slow speed of 420 r.p.m. and high torque it accelerates penetration of the hardest material without damaging the valuable tip. At the touch of a button the speed is changed to 1200 r.p.m. for standard twist drills. Ask for Technical Publication R1573.

Sold in the bright orange and blue metal container clearly marked Rawlplug Durium.

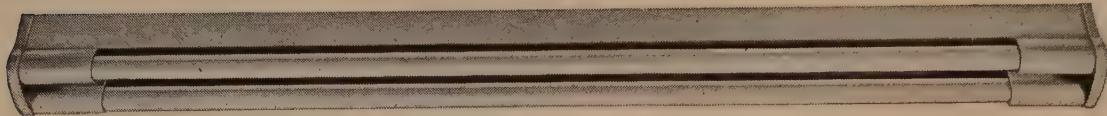


Look for the name DURIUM on the drill shank, no other is a genuine DURIUM Drill.

# FLUORESCENT



## FITTINGS THAT



## FIT YOUR



## BUDGET



Whether you are choosing lighting fittings for a single room or a whole building, an office block or a factory, send for the facts about our Sielect range—particularly the cost.

Briefly, the Sielect range offers you a choice of single or twin fittings, with open tubes, two kinds of reflector, or with reeded Perspex diffusers. The basic unit has been approved by the Council of Industrial Design and the range fits happily into any type or style of interior.

In addition it is offered

at an extremely attractive price. Finally, it is easy to service and clean, while the special epoxy resin finish is extremely tough and highly resistant to chemical attack. Full information about the entire series of Sielect fittings is yours for the asking in the Siemens Ediswan publication, PD11/F33. If you want help in planning or estimating for a new installation, let us know and we will send along one of our staff of experienced lighting engineers without fee or obligation.

**Associated Electrical Industries Ltd**  
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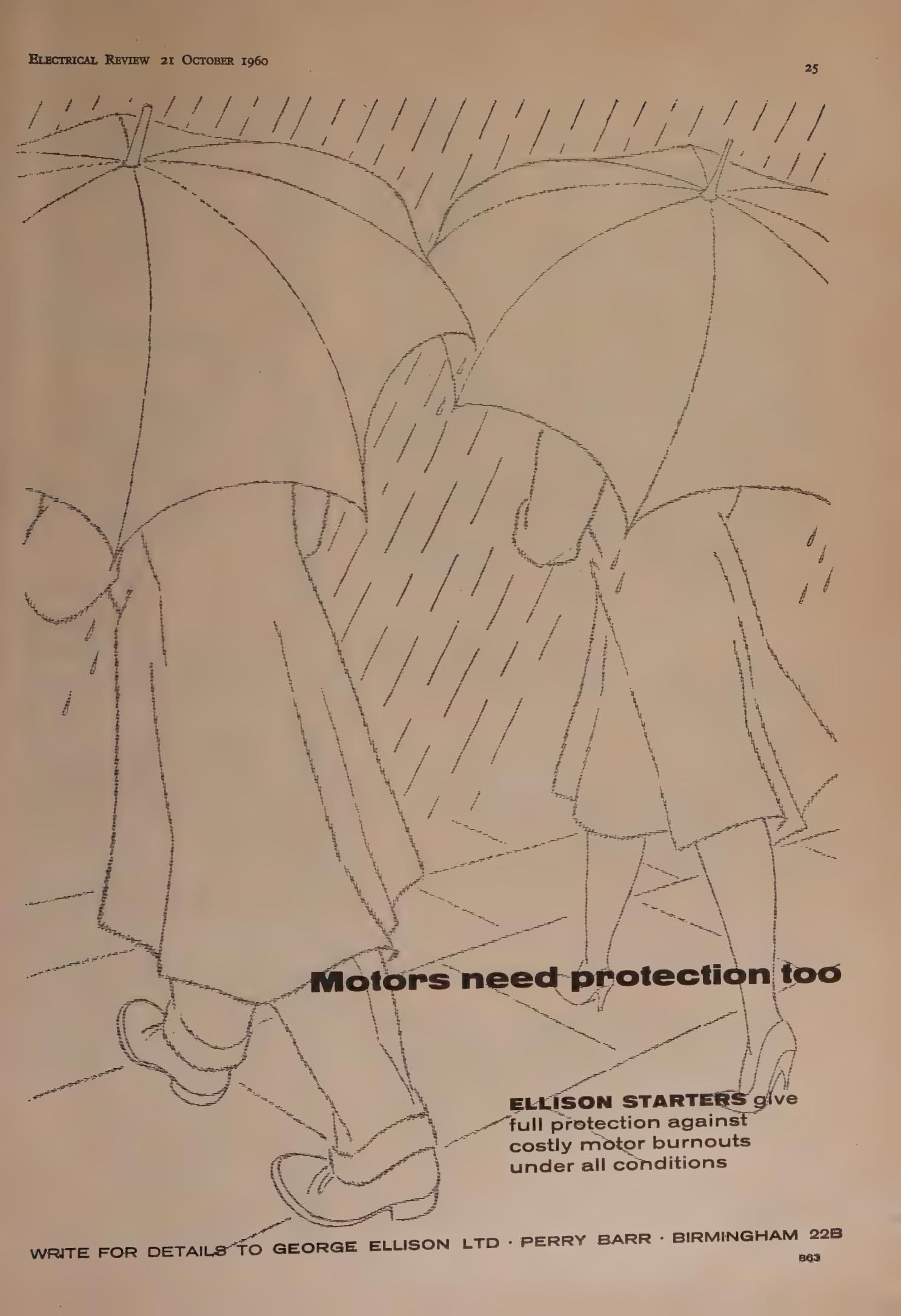
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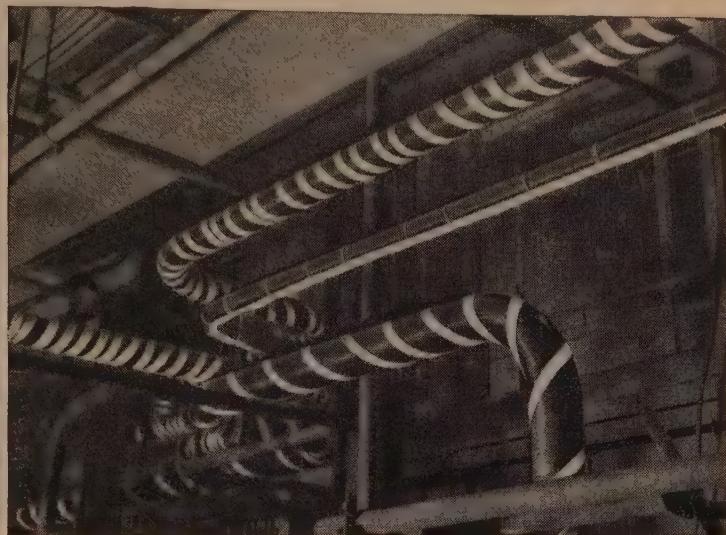
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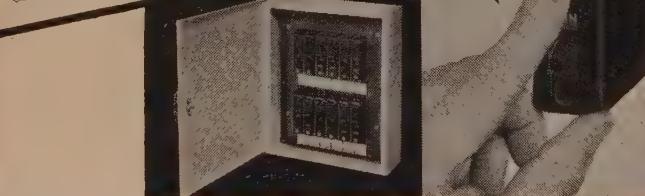
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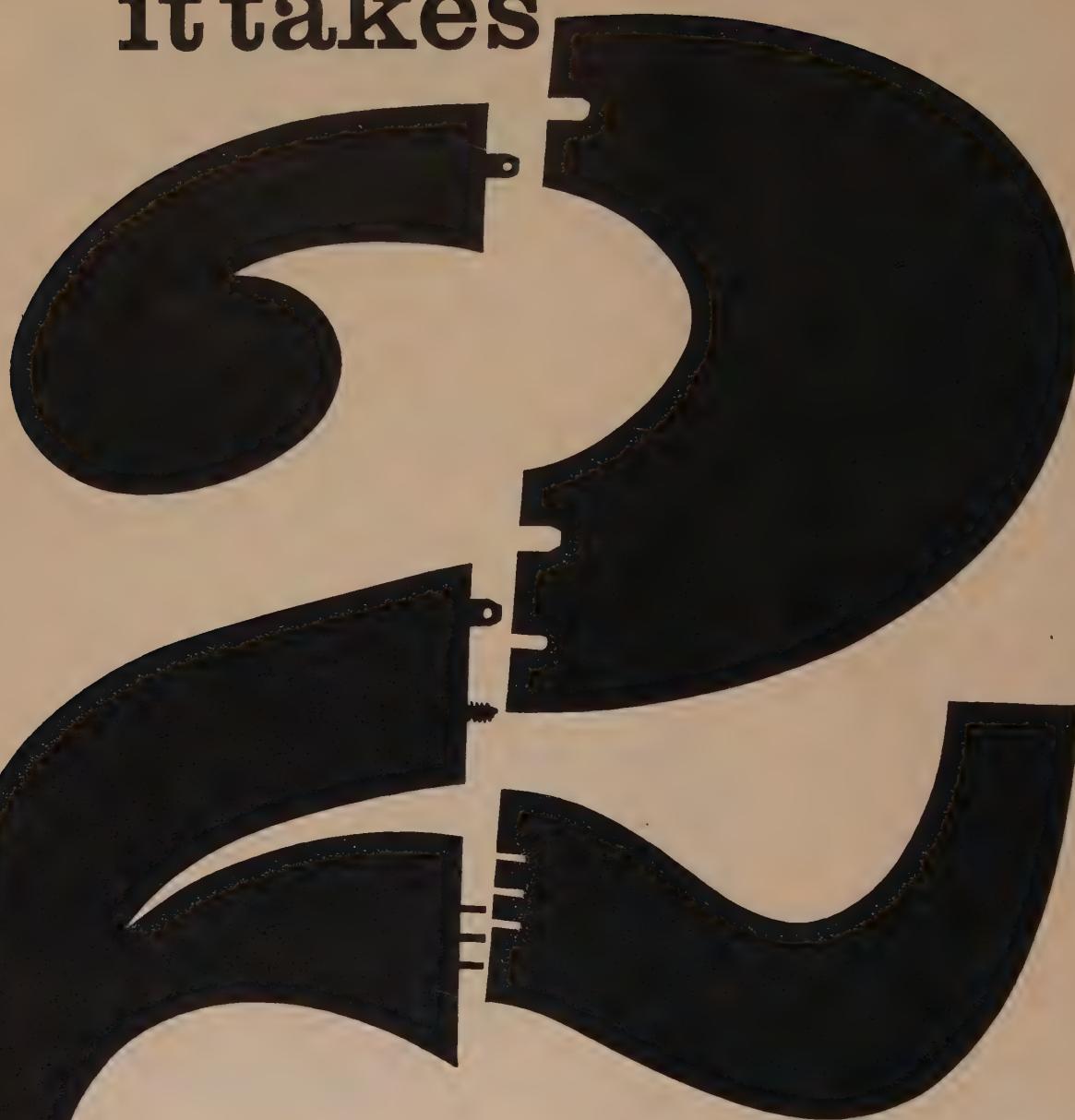
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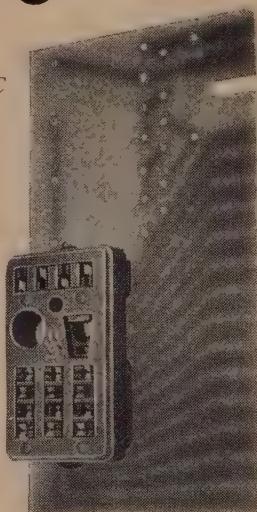
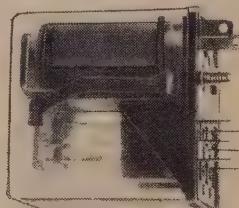
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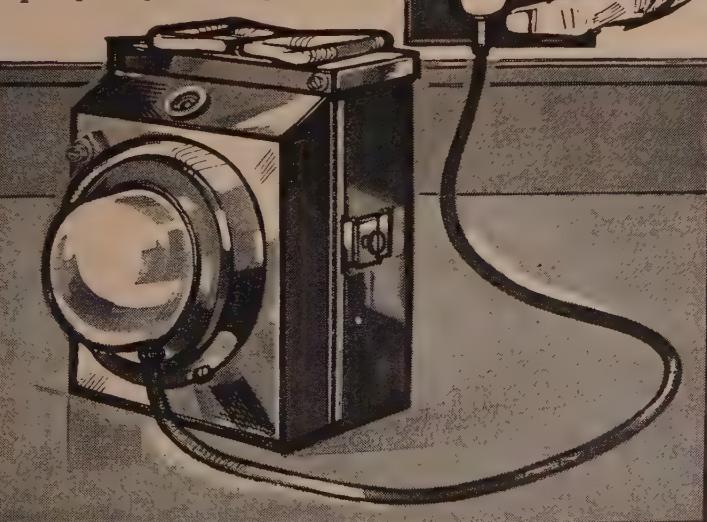




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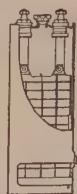
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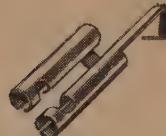
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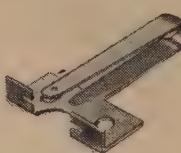


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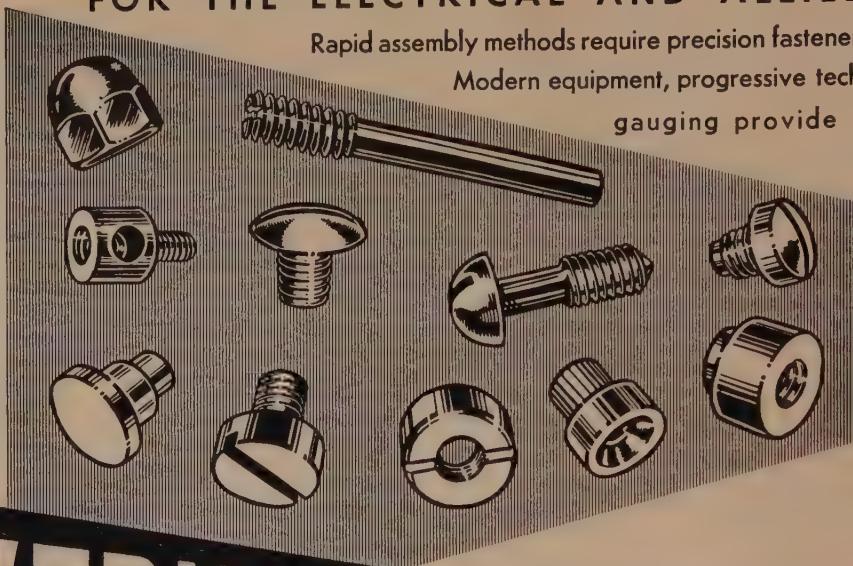
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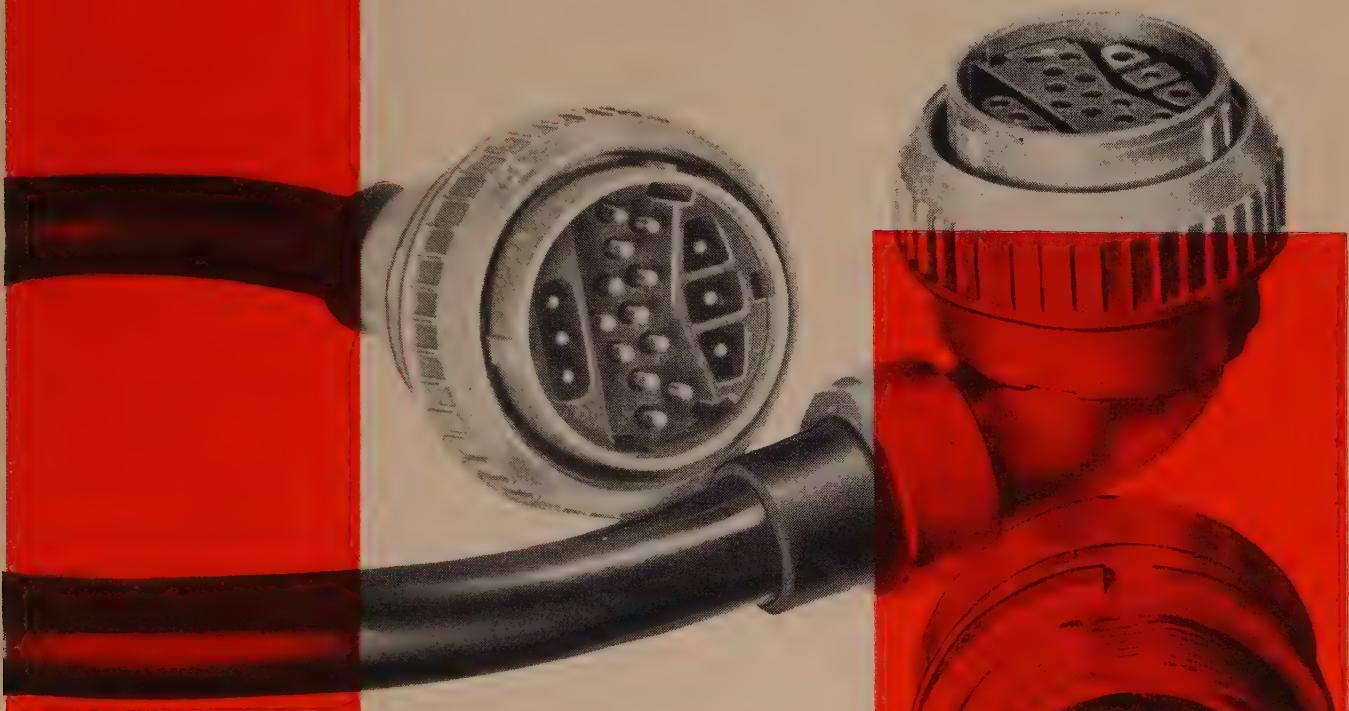
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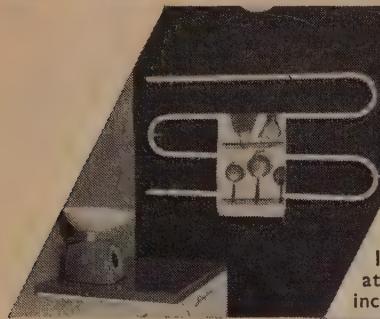
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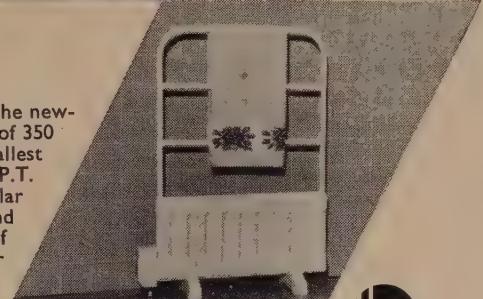
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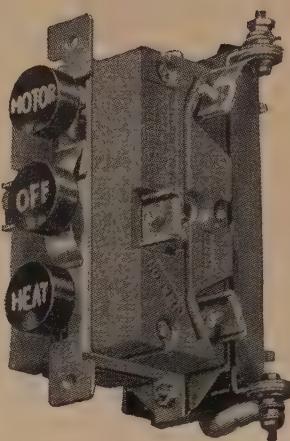
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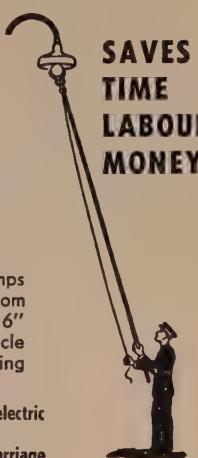
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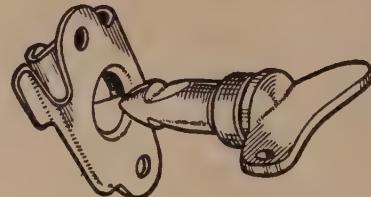
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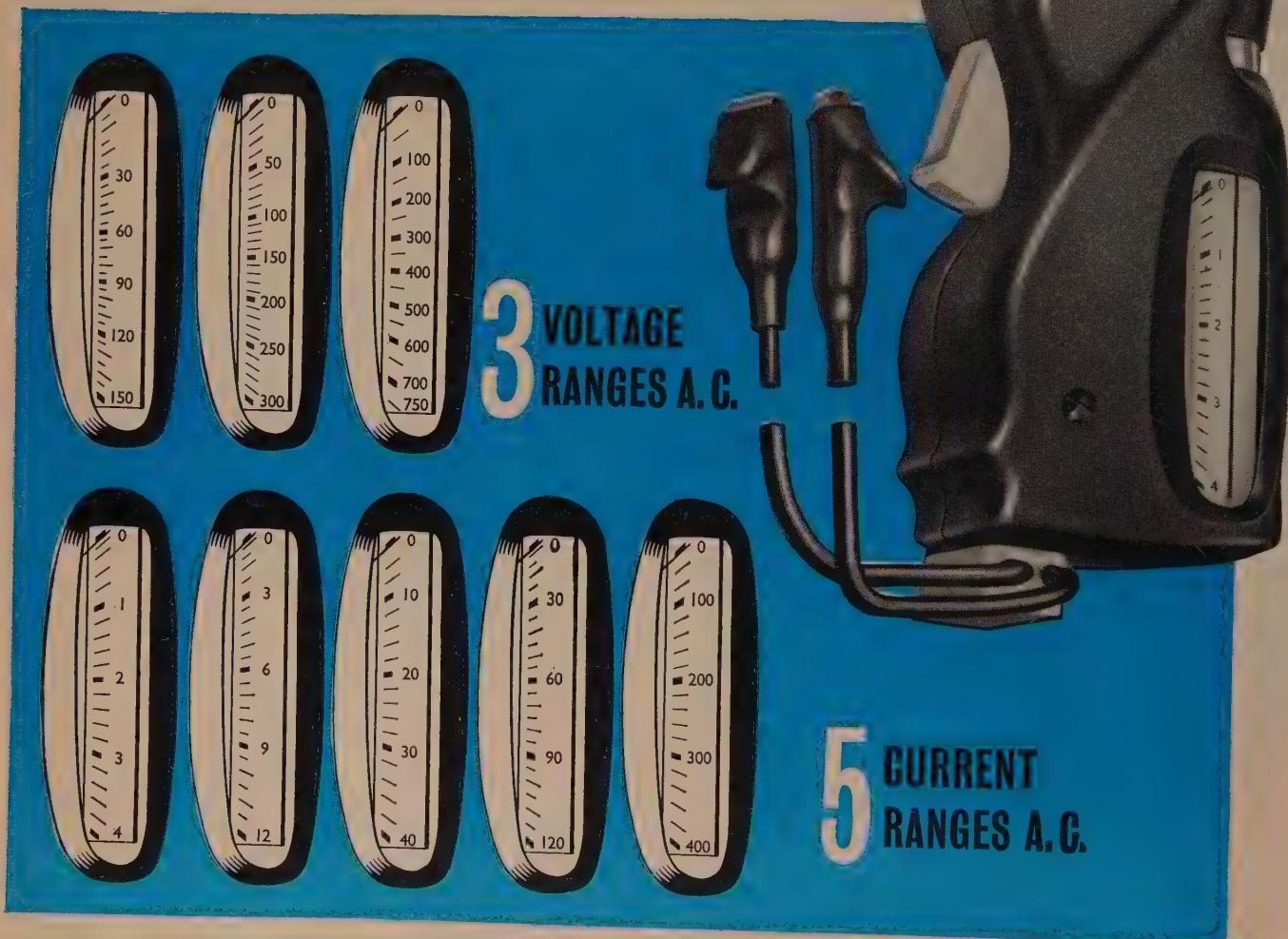
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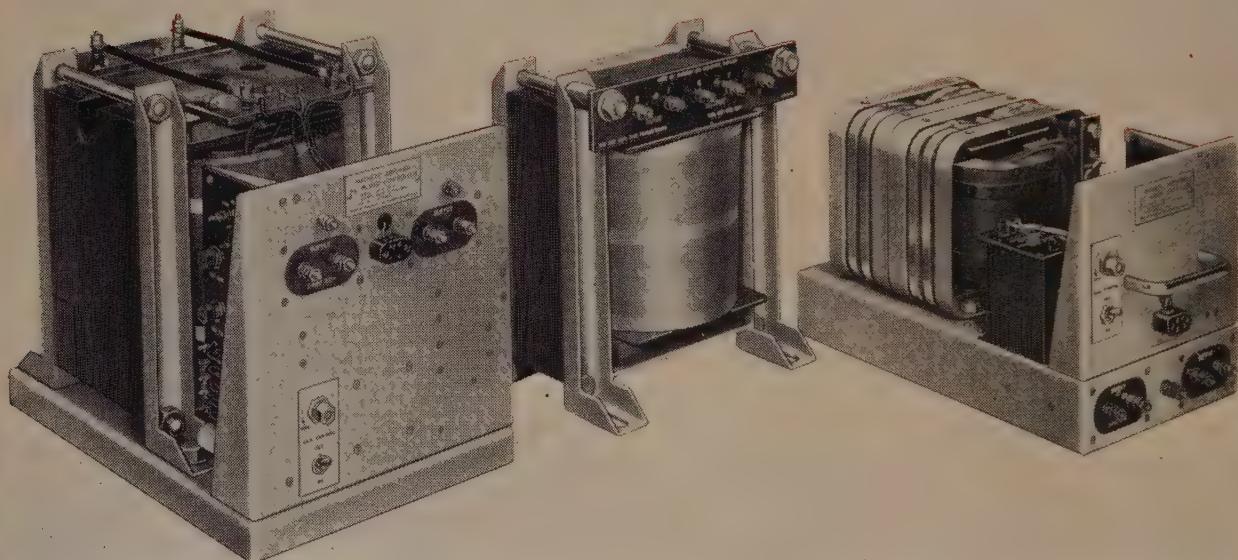
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These units have been designed to control A.C. power loads and find many applications in the controlling of power to furnace elements, incandescent lamps, rectifier equipments, etc. Being robustly constructed and containing no moving parts, they require no maintenance during the course of their almost indefinite life. In operation, the heat they generate is negligible and consequently they may be fitted into cubicles of smaller dimensions than would be acceptable for equivalent types of control. The standard range is comprised of models rated at 1 KVA, 3 KVA, 5 KVA, 8 KVA and 10 KVA and designs for other powers can be readily made available.

For full information and technical leaflet write to—

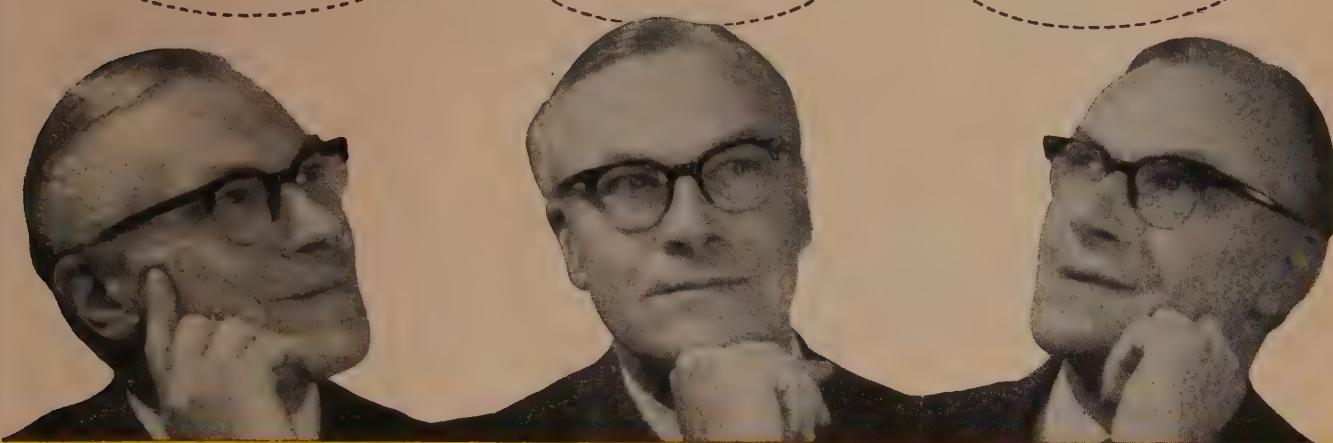
**PARMEKO LIMITED • PERCY ROAD • LEICESTER Telephone 32287**

# the works manager made 3 wishes . . .

'GIVE ME STARTERS THAT ARE EASY AND CHEAP TO INSTALL'

'GIVE THEM LONGER SERVICE LIFE'

'LOWER MY MAINTENANCE COSTS'



...and BROOKHIRST IGRANIC made them come true

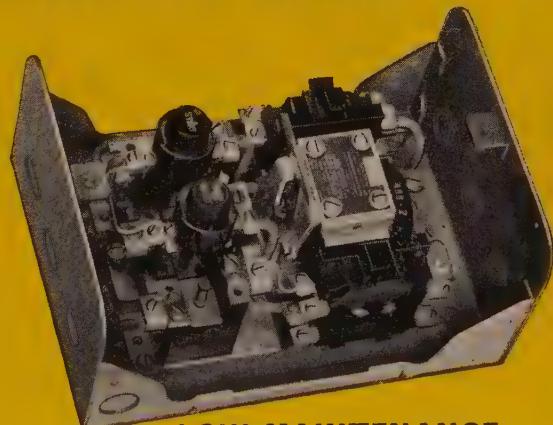
with a new range of starters

(for all induction motors)

that are also lighter, more compact,

safer, better than ever—

designed to outlive the motor.



#### EASY INSTALLATION

- \* Wrap-round front removal cover.
- \* Interior mechanism lifts out.
- \* Embossed key-hole mounting ensures firm support.
- \* Generous conduit knock-outs and clamp type terminals for speedy wiring.

#### LONG LIFE

- \* Vertical dust-safe contacts.
- \* Exceptional contact life.
- \* Small-mass moving parts.

#### LOW MAINTENANCE COSTS

- \* All-round accessibility to all parts.
- \* Full servicing with screwdriver only.

**ALL THESE ADVANTAGES ARE AVAILABLE TO YOU NOW  
ON STARTERS UP TO 30 H.P.  
RELATED DESIGNS ALSO AVAILABLE UP TO 100 H.P.**

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Makers of Britain's widest range of electrical control and associated equipment

BI.31



Metal Industries Group

"ELMO"

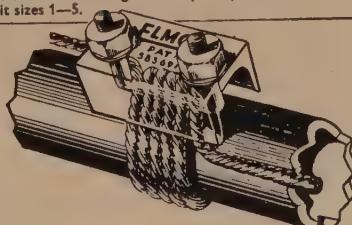
## EARTHING CLAMPS

A COMPLETE RANGE TO B.S.951. 1948  
IN 4 SIZES

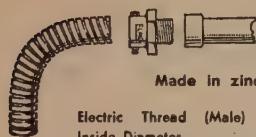
	A123	B45	C67	D8910
for earthing cables up to	7/0.036"	7/0.064"	19/0.064"	19/0.083"
to fit B.S. conduit sizes i.e. in trade terms	1, 2 & 3 $\frac{1}{2}$ " to $\frac{3}{4}$ "	4 & 5 1" and $1\frac{1}{4}$ "	6 & 7 $1\frac{1}{2}$ " and 2"	8, 9 & 10 $2\frac{1}{4}$ " to $3\frac{1}{2}$ "

NOTE ALSO: Type A123 is suitable for Earthing Cables up to 7/0.029" and for B.S. conduit sizes 1—5.

"Elmo" Earthing Clamps are of robust construction. Impossible for wire to pull out, always under tension, therefore a most satisfactory earth and a permanent safeguard.



## ELECTRICAL FITTINGS



### Flexible-to-rigid CONDUIT COUPLINGS

Made in zinc base alloy in the following sizes:

Electric Thread (Male) 1" 1" 1" 1 $\frac{1}{2}$ " 1 $\frac{1}{2}$ " 2"  
Inside Diameter 1" 1" 1" 1 $\frac{1}{2}$ " 1 $\frac{1}{2}$ " 2"

Electric Thread (Male)  
Inside Diameter Flexible Conduit 1" 1" 1" 1"

### WITH EARTHING TERMINAL

Special Features: Integral Earthing Terminal, tinned ready for soldering. Fixing screw for continuity. Internal Threads suit all makes of flexible tubing.



### CONDUIT BUSHES

Made in the following sizes:

MALE: Electric Thread  
1" 1" 1" 1 $\frac{1}{2}$ " 1 $\frac{1}{2}$ " 2"

FEMALE: Electric Thread  
1" 1" 1" 1 $\frac{1}{2}$ " 1 $\frac{1}{2}$ " 2"



FEMALE  
Flat Face Section for  
Spanner (except 1" size, which is round)

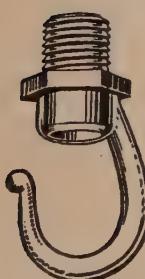
MALE  
Hex. Section

### CONDUIT HOOK

For fluorescent lamps and overhead lighting fittings. Screwed  $\frac{1}{2}$ " thread, male electric.

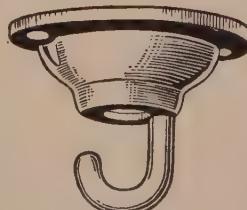
Made to fit all standard boxes with two holes 7/32" diameter —2" centres diametrically opposed. Designed in accordance with British Standard Specification.

Both made in aluminium alloy



### CEILING PLATE

One hook



61

# University Scholarships

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by Electricity  
Supply

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36 scholarships, all in electrical engineering, are offered by the 12 Area Electricity Boards. 25 scholarships, in a wide range of science and engineering subjects, are offered by the Central Electricity Generating Board.

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The Electricity Council,  
12 Winsley Street, London, W.1.

12856-2

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AVAILABLE IN  
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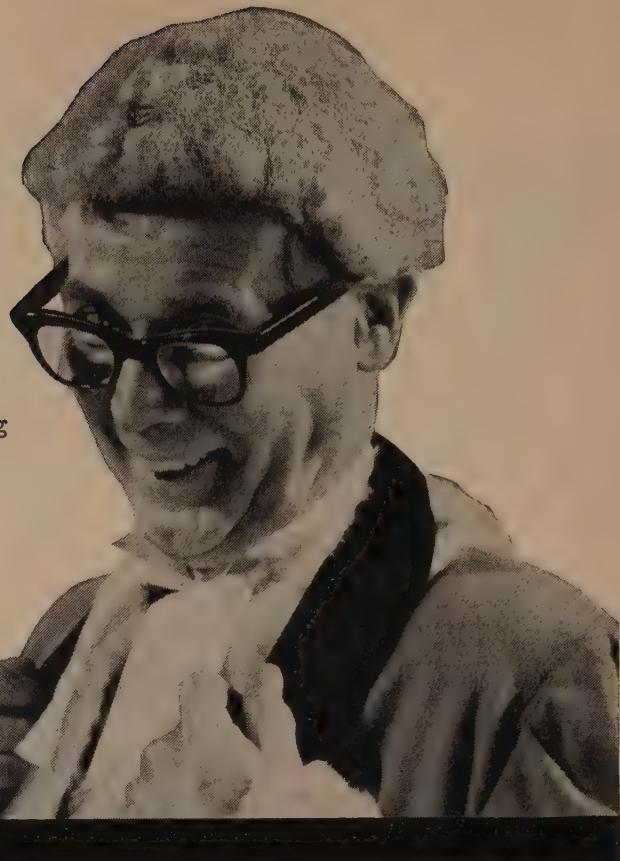
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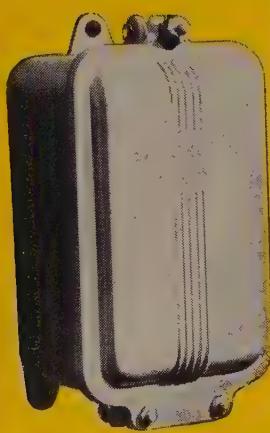
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"In the matter of  
Electric thermal storage heating  
I submit that the case for the  
Satchwell QA/QR Control  
is well and truly proved"



The QA external thermostat incorporating a small electric heater, enclosed in a weather-proof case

And many Electricity Boards throughout the country think so too. Practical tests have established the value and control quality of the QA/QR system; one Supply Authority has reported a saving in current consumption of 36%.

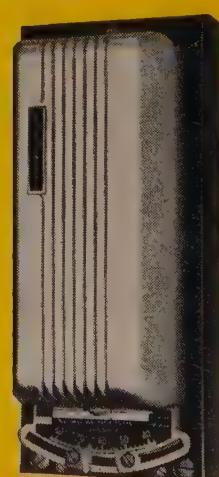
The QA/QR system is simplicity itself, employing both internal and external temperature sensitive units which govern the charging time. Installation presents no problem at all, and the system is one of the most efficient available for this type of application, at a very low initial cost.

May we send you list T2 which gives full details?

**THE RHEOSTATIC CO. LTD.**

**SLOUGH • BUCKS • SLOUGH 23961**

The QR internal thermostat which is mounted inside the building and set to the required room temperature



# copper bars & rods



## HOT WORKING OF COPPER

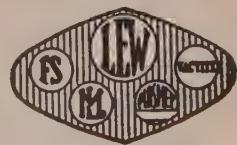
The first stage in the manufacture of a wrought copper product consists of hot working a casting.

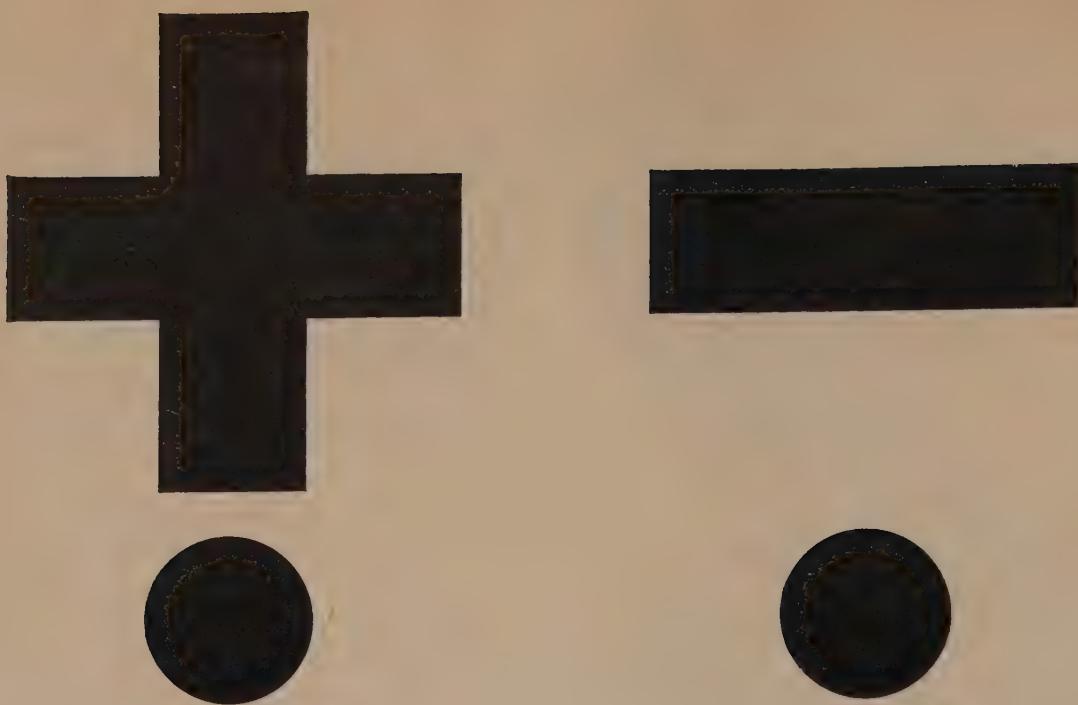
The wire bars used for hot rolling are of various selected qualities and are channelled carefully into the appropriate finished form.

We have been hot rolling copper for many years and have three separate mills for the process.

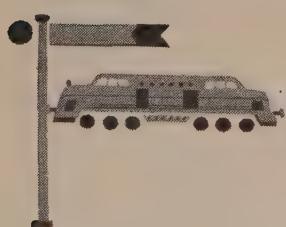


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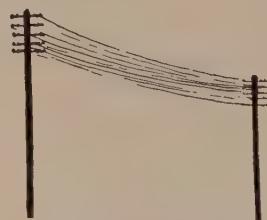
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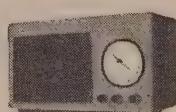
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Known throughout the world for high quality and long life

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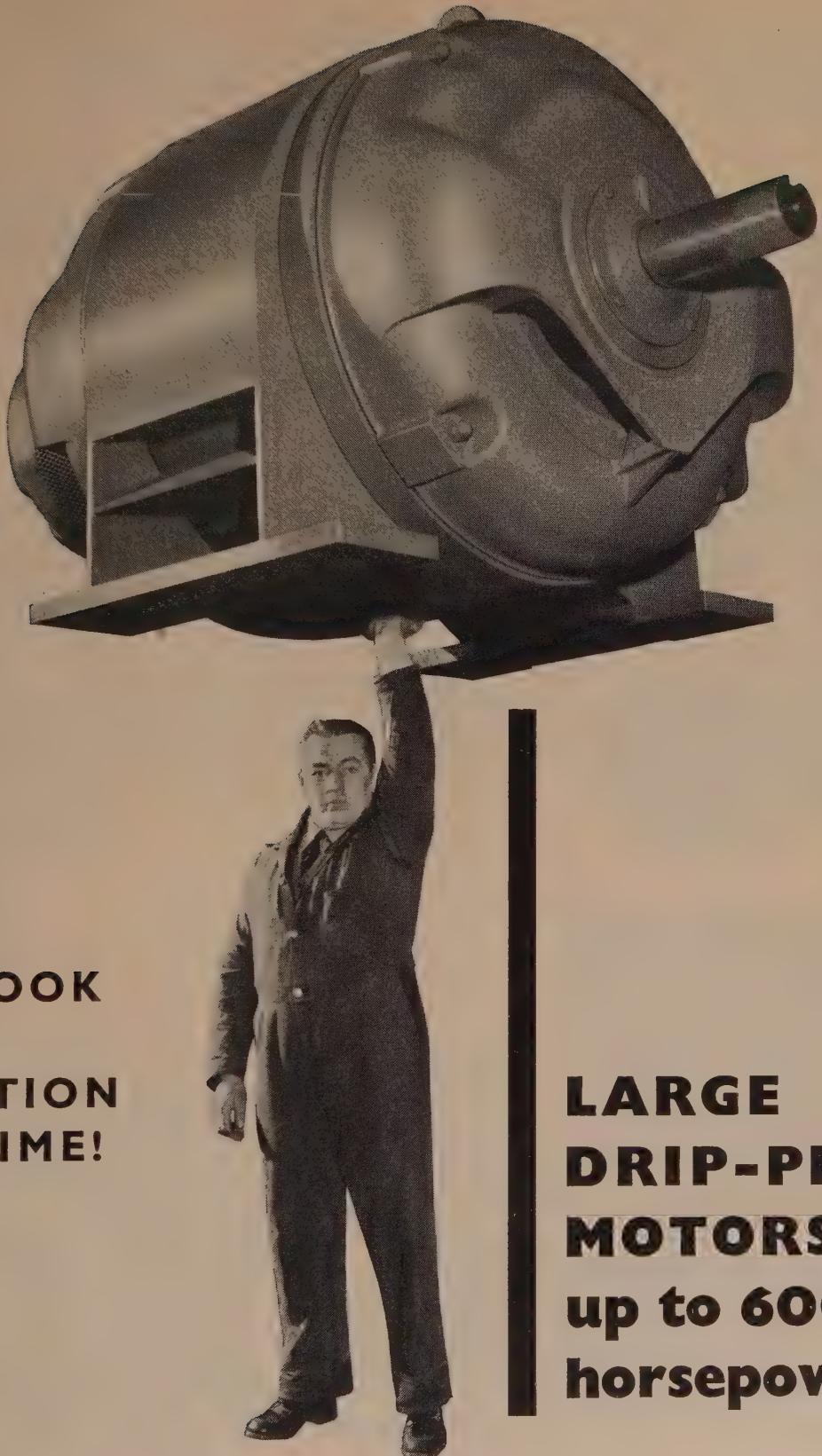
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# No other lamp in the world has all these features

**Long life**

**Full light output**

**Patent shatterproof fuse**

**Resistance to shock**

**Can be used any way up**

**Low current consumption**

The secret of the long life\* of Crompton Life-Light is, first, that it has a single-coil filament which is inherently far stronger than a coiled-coil filament can be. Second, that this stronger filament is better supported. As to light, tests show that the very small difference in the light-output of single and coiled-coil lamps (8% in the most popular size) is unnoticeable — less than normal variations due to other causes. Finally, there is no dust inside a Life-Light lamp — because it is washed on the lamp-making machine immediately before sealing.

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- 1 An attractively designed centre piece which can be positioned in such a way as to fit any size window — and can be used inside your shop afterwards.
- 2 A showcard which echoes the general advertising theme. Its size is equally suitable for counter display.
- 3 A well-balanced mobile to attract your customer's eye.
- 4 A display of lamp cartons in the new pack.
- 5 Price lists to add to the attractiveness of the window display and for use on your counter.

**Stock up now.**



**For use inside  
your shop:  
this self-service  
dispenser, 61" high  
is a wonderful  
sales aid.**



# Crompton LIFE-LIGHT



Explain to your customers, as we have explained to you, why Life-Light lamps are better — it will pay handsomely in goodwill. Crompton Life-Light cost no more than ordinary lamps.

**CROMPTON PARKINSON LTD., CROMPTON HOUSE, ALDWYCH, LONDON, W.C.2.**

# NEW PLUS FEATURES

for the famous

## BEDFORD LIGHT VAN!



### **PLUS increased gross ratings**

Maximum gross vehicle weight increased by 200 lb., front axle up-rated to 1650 lb., rear axle up-rated to 2850 lb.

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The right transmission combination for every job. Choice of three different axle ratios, plus new gearbox ratios, plus smaller wheels.

### **PLUS lower loading level**

13" wheel and tyre equipment give lower floor level and lower overall height. Plus lower centre of gravity, more comfortable ride, better cornering.

### **PLUS extra long life engine**

Famous Vauxhall 4-cylinder over-square engine now fitted with special alloy, high-duty big end bearings which contribute to extra long life at high speeds.

### **PLUS many detail improvements:-**

Toroidal ball steering joints. Strengthened steering system. Chrome hub caps. Flat-topped rear wheel arches. Redesigned instrument panel, and other details.

### **PLUS top value for money**

10/12 cwt. 90" wheelbase van £450. 15 cwt. 90" wheelbase £460. 10/12 cwt. 102" wheelbase £470. 15 cwt. 102" wheelbase £480.\*

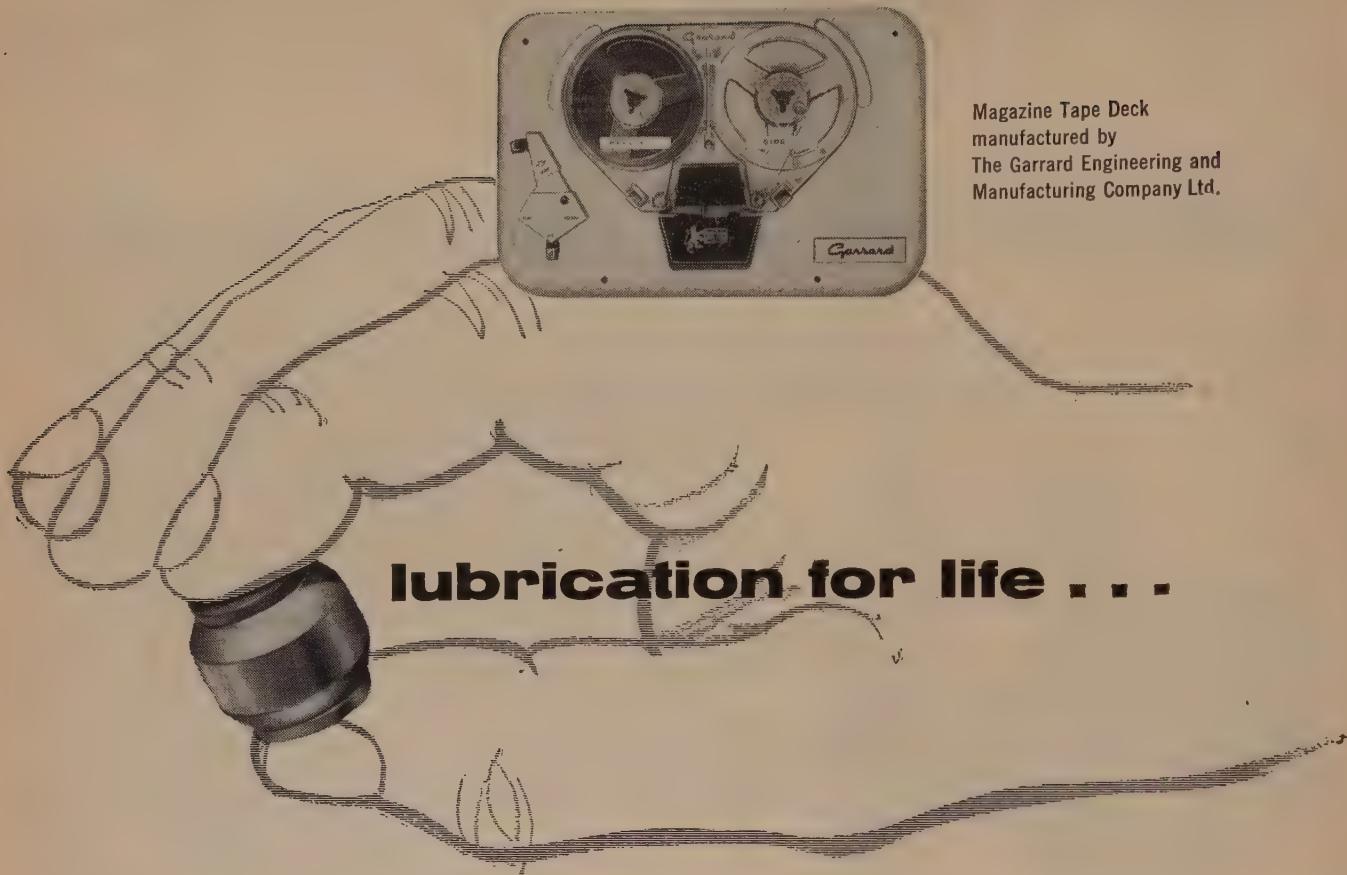
### **Only Bedford offers all these advantages**

- Semi-forward control — no bulkhead between driver and load ■ Engine does not obstruct cross-cab movement ■ External sliding doors ■ Easy to manoeuvre, turns in 34 ft.
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- Two models: 90" and 102" wheelbase ■ Capacity: 144 cu. ft. for the 90", 171 cu. ft. for the 102" ■ Two ratings for each wheelbase 10/12 cwt. or 15 cwt.

\* All Bedford van prices include spare wheel and tyre.

Vauxhall Motors Ltd, Luton, Bedfordshire

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The production of bearings by the powder metallurgy process is our specialized business. Extensive technical research and development are behind every Lubrook Bearing and enable us to match them to the widening range of mechanical requirements. Powder size analysis, physical testing and extensive running-tests ensure the controlled porosity, structural strength and lubrication capacity of each bearing.

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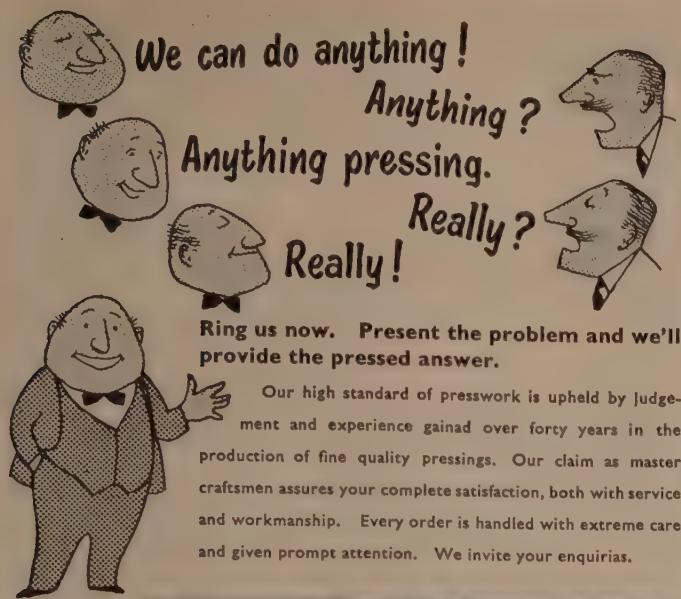
Telephone : Lichfield 2027-8 · Telegrams : Boundless, Lichfield



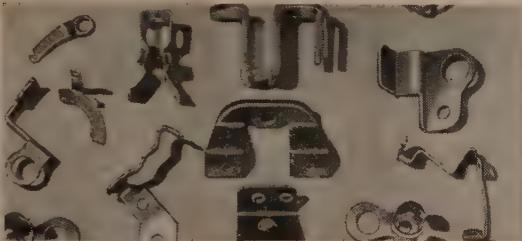
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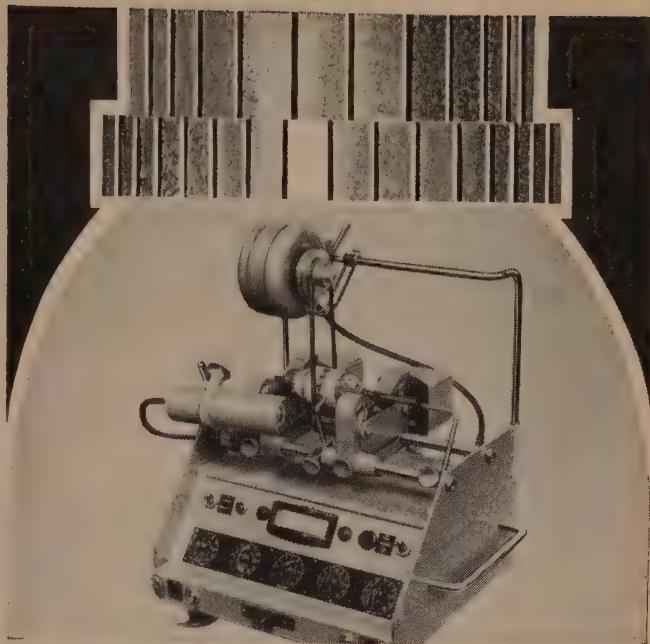
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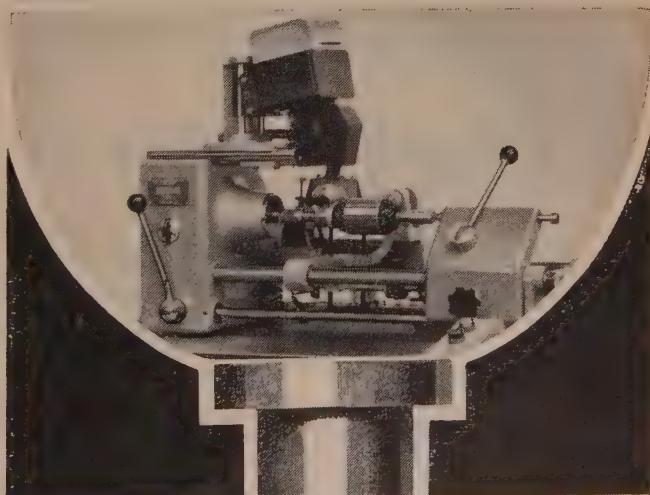


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E.M.I.'S BALANCERS AND UNDERCUTTERS ARE IN WIDE-SPREAD USE BY MAJOR MANUFACTURING COMPANIES THROUGHOUT THE WORLD



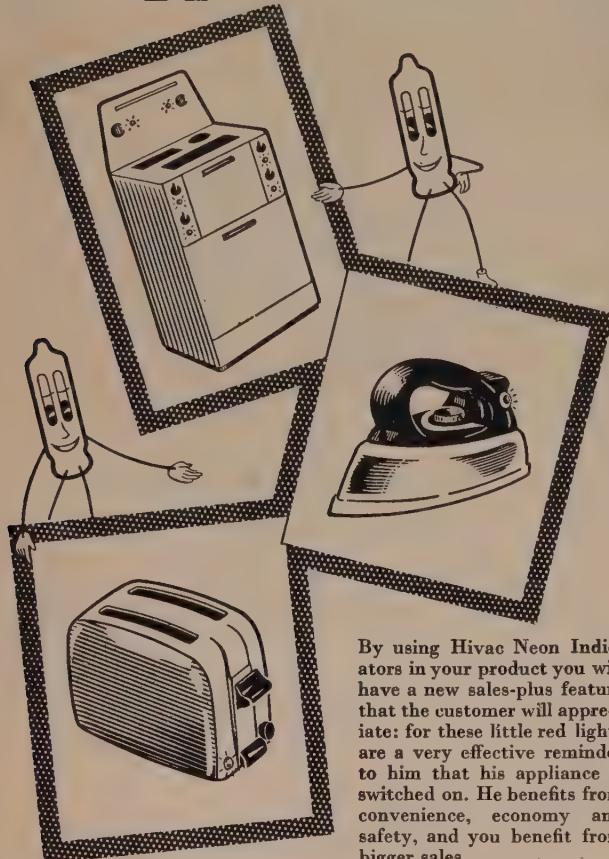
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EE117

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*It just glows to show!*

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**STAR 15—5' Batten**  
Amazing value  
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**SUN 25—Twin 5' decorative**  
Remarkable value  
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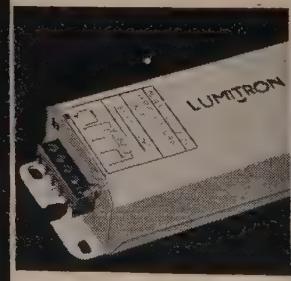
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**BELL 25—Twin 5' perspex fitting**  
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# Remember THAT **REDRING PLATES**

**GIVE FASTER COOKING, BETTER SIMMERING  
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There's only one brand of REDRING radiant plate. There's only one kind of REDRING speed and efficiency. When your customers ask for 'REDRING'—it's only fair to see that they get just that. As soon as they cook with a genuine REDRING plate—they'll see you've given them the best!

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**REDRING**  
*Slimline Radiant Plates*

**Made only by  and guaranteed for two years**

Better than ever advertising backing—with campaigns reaching over 30 million adult readers! Better than ever 'Slimline' design which clips seconds even off previous Redring times!

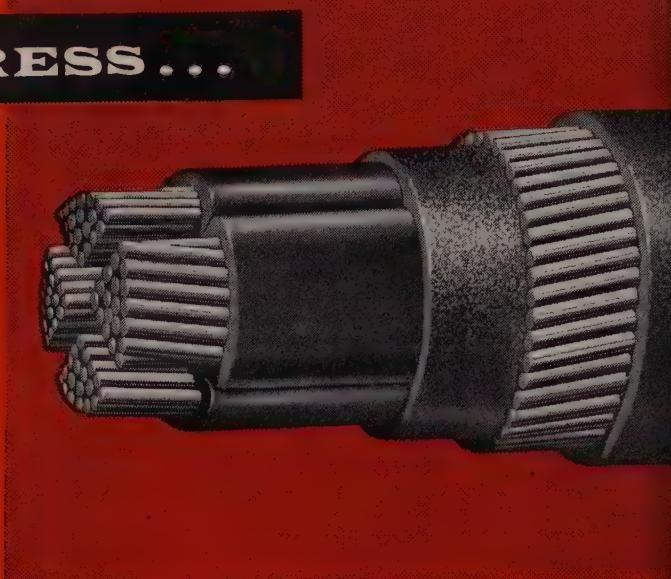
HEATING AND WELDING DEPARTMENT  
ASSOCIATED ELECTRICAL INDUSTRIES LIMITED, TRAFFORD PARK, MANCHESTER 17

## 60 YEARS OF PROGRESS...

### P.V.C. INSULATED POWER CABLES

Available for the same conductor range as for Paper Insulated Cables, to B.S. 480/1954, for voltages up to and including 3.3 Kv.

*Send for publication No. B16*

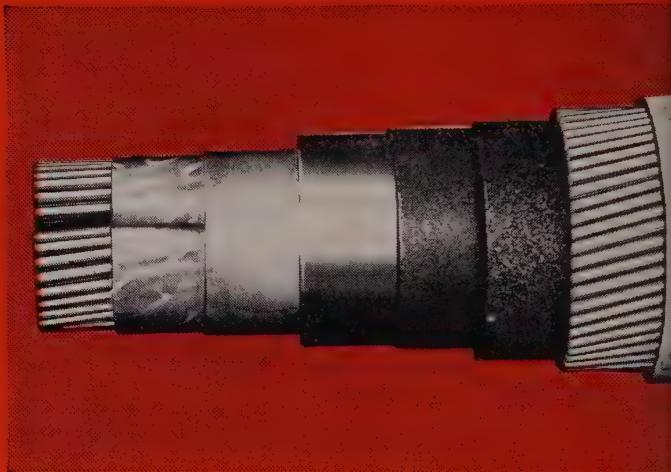


# CONNOLLYS

### PAPER INSULATED POWER CABLES

Standard range covers 1,100 volts to 11,000 volts with full range of armouring and overall protection with bituminous textiles or P.V.C.

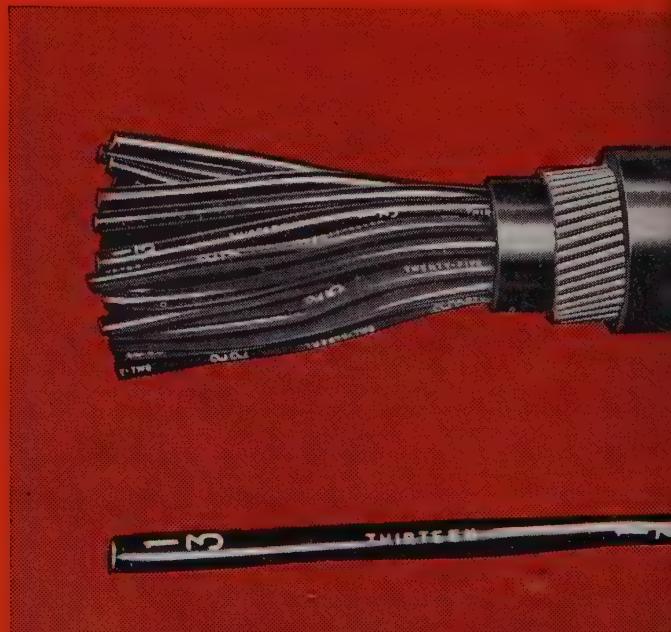
*Further details on request.*



### PILOT AND CONTROL CABLES

A range of power and control cables is available at voltages up to 1,100. To facilitate identification, the P.V.C. insulated cores are clearly printed at frequent intervals with the appropriate legend and numerals. The laid up cores are sheathed with P.V.C. and can be armoured and P.V.C. protected if required.

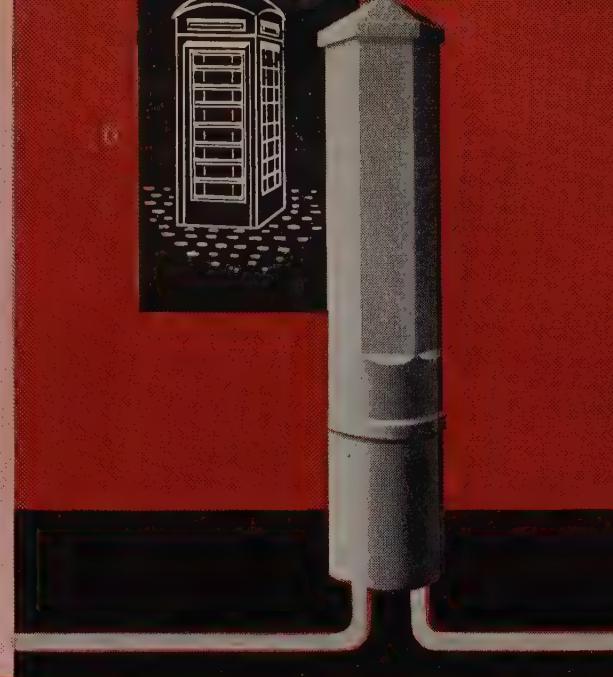
*Further details on request.*



## TELECOMMUNICATION CABLES

Connollys plastic insulated and sheathed cables are servicing telephone administrations throughout the world. Cables can be armoured with protected galvanised steel if there is a danger of mechanical damage, or they can be supplied with inbuilt catenary for overhead suspension. All cables are suitable for installation in tropical conditions.

*Send for publication B.11A (Polythene Insulated) and publication B.14A (P.V.C. Insulated)*



## FOR CABLES

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Connollys stock a wide range of plastic insulated and sheathed cables in accordance with B.S. 1557/1954 (Polythene insulated, P.V.C. sheathed) and B.S. 2004/1955 (P.V.C. insulated, P.V.C. sheathed).

*Further details on request.*



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'Blackley' Tape has been produced by Connollys since 1895 and its adhesive and insulating properties are appreciated throughout industry. The adhesive surfaces never 'strip' because the rubber compound is frictioned on to both sides of specially woven cloth. Available in widths  $\frac{1}{2}$ " to 2" in 5, 10, 25 and 50 yard rolls.

*Send for publication No. B.12.*

### CABLE DIVISION

# CONNOLLYS (BLACKLEY) LIMITED

HEAD OFFICE AND WORKS MANCHESTER 9

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**It's the fastest on the market!**

#### SOME OF THE NEW HALO'S WONDERFUL FEATURES

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**Better heat control**—as well as rapid heating, the Halo gives quick cooling, to ensure the flexibility housewives like.

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*More information.* Please write to the address below for the comprehensive technical booklet, T.S. 610.

#### SIZES AND LOADINGS

		Size	Loading (Watts)
Single heat	{	6½ in. diameter	1350
		8 in. diameter	2300
Three heat	{	6½ in. diameter	1350
		8 in. diameter	2300

**A.E.I.-HOTPOINT LIMITED**

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**VARIACS** are available open or covered, as single units or ganged assemblies, for manual operation or motor-driven.

The range includes portable, metalclad and oil-immersed models, dual-output types, high-frequency types and many 'specials'. Write for complete information.



This 3-gang assembly, Type 50-BMG3, will control 22.5kVA, 3-phase or single-phase according to connection. Larger assemblies can be made.

★ Duratrak? Duratrak (Regd. Trademark) — a patented\* feature exclusive to Variac — is a special plated contact surface giving longer life, increased overload and surge capacity and maximum economy in maintenance. Duratrak is now standard on all models except Series 50.

\*U.K. Pat. No. 693406

ONLY VARIAC HAS DURATRAK



This small Variac, Type V-5HMTF, provides an output of 0-270 V, 2 A, from 240 V 50 c/s mains. A still smaller model, Type V-3H is rated at 1 A.



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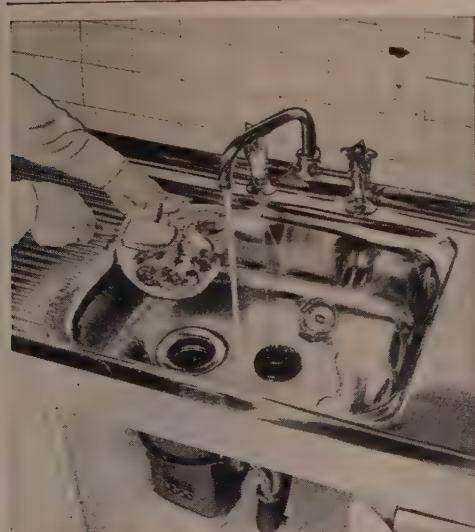
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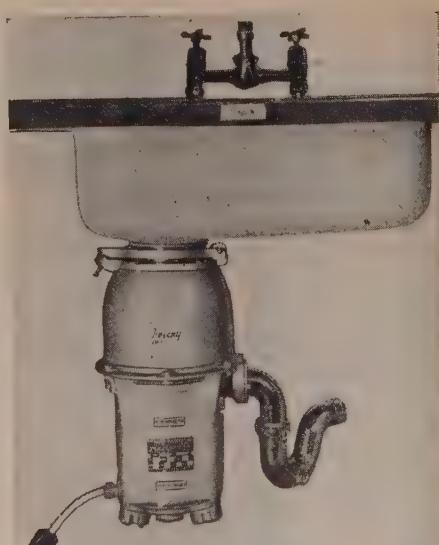
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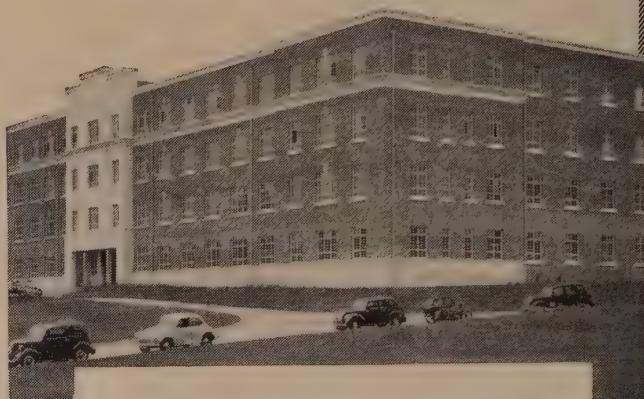
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## IMPORTANT NEW BUILDINGS

## heated with **B & A ELECTRODE** Hot Water Boilers



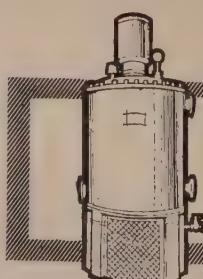
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- \* Kensington Civic Centre
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- \* Elec. Board for Northern Ireland  
(Illustrated above)
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- \* English Electric House
- \* Plymouth Civic Centre

Write for Catalogue ER



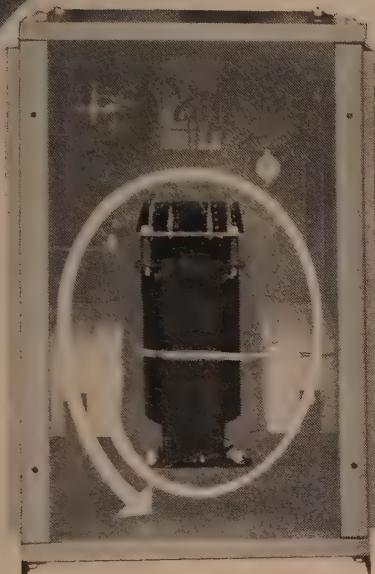
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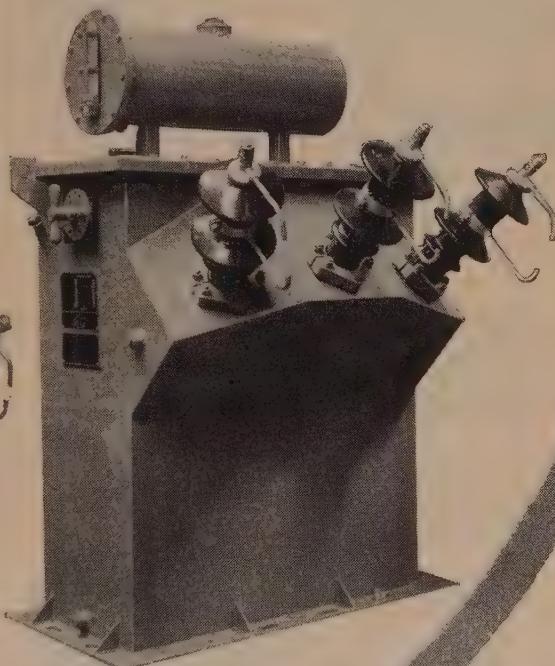
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and  
—it's done

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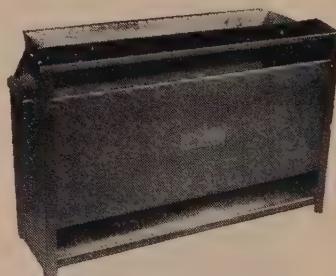
Ask for leaflet 2-IHsp



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Should you want information about our Low Voltage Soil Warming Equipment, this also will be gladly supplied.

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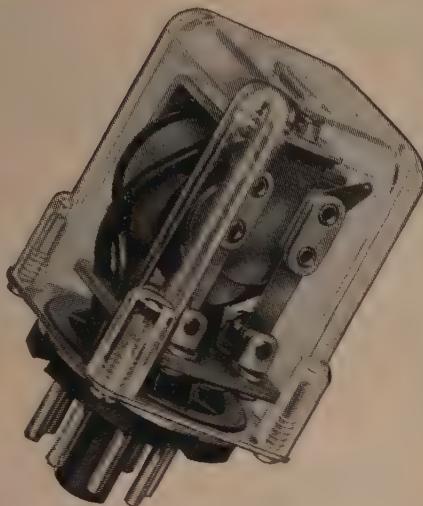


For wall, bench or machine mounting. Catalogue sent free on request.

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# New...THORN PLUG-IN RELAYS

## Thorn Pygmy Power Relay



**New interchangeable relay designed for use in remotely controlled automation units. Has double pole changeover contacts.**

**Dust proof—transparent plastic cover.**

**Plugs into any standard International octal valve base.**

**Weight Only 4½ ozs . . .  
projection only 2" above base.**

**Mechanical life over  
10,000,000 operations.**

Switching current: 5 amps maximum at 250 volts A.C.

Maximum surge current: 10 amps.

Operate time: 8 milliseconds approx.

Release time: 6 milliseconds approx.

Overall dimensions: 1½" square by 2½"

Coil voltage: 240 volts standard; also available for 6, 12, 24, 48, 60, 110 volts

## Thorn T9 Micro-Switch Relay

*A plug-in relay, particularly suitable for switching P.A. equipment, the snap action contacts minimising interference with pick-up leads.*

*Operating coil wound for any specified voltage up to 240 volts A.C. or 150 volts D.C. May be tropicalised.*

*Up to three micro-switch pattern contacts mounted on standard coil frame.*

*Versions available with up to 11 solder tags or 10 screw terminals.*

**Contacts:** 3 changeover.

**Mechanical Life:** Over 10,000,000 operations.

**C/O Time:** C.O. period less than 2 milliseconds.

**Max. Switch:** 10 amps/240 volts A.C. noninductive load.

**Capacity:** 0.2 amps/240 volts D.C. " " "

0.5 amps/110 volts D.C. " " "

1.0 amps/50 volts D.C. " " "

5 amps/24 volts D.C. " " "

**Max. Operate Speed:** 20 cycles/sec.

**Switching:** Up to 0.1 amp. approx. 20 cycles/sec.

**Frequency:** " " 1 " " 5 " " "

" " 5 " " 1 " " "

" " 10 " " 0.1 " " "

(referred to A.C. non-inductive load).



**Thorn**

Thorn Electrical Industries Limited Special Products Division

(Incorporating Components and Connectors)

Great Cambridge Road, Enfield, Middlesex.

Telephone: ENField 5353



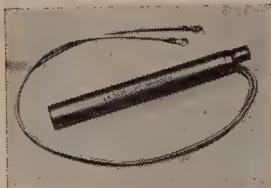
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*For advice on efficient  
heating or cooling controls  
you're bound to recommend*

## Precision **PULLIN** THERMOSTATS

### FLOOR LIMIT THERMOSTAT (L4)

has been specially developed to control under-floor heating installations to an accuracy of plus or minus one degree. It is a precision instrument, sealed against dust and moisture, and is used in conjunction with the Pullin A2 Room Thermostat. Once set and installed, it usually requires no further attention.



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Two models available—the A2/W and A2/WNL. Precision built to critical specifications and designed to control electric under-floor heating, storage heaters, tubular heaters, warm air systems, etc. Reverse action Thermostats, models A2/RA and A2/RANL, have a proven record after extensive testing. Designed to meet the demand for cooling applications in industry and agriculture, they are accurate to the finest limits.



**YOU WILL ALSO WANT INFORMATION** on further additions to the wonderful range as they are developed during the year—a range of instruments that will provide accurate control for all types of heating or cooling equipment whether industrial or domestic.

### THINK OF PRECISION THERMOSTATS—

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\*Colour Sprayed.

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# ELMET contacts eliminated a “more or less endless job”

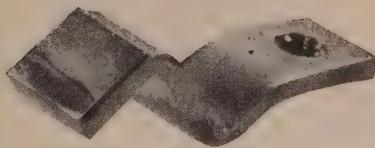
**THE UNRETOUCHED PHOTOGRAPHS** below show the two actual sets of contacts referred to in this letter from The Solway Pre-Cast Products Ltd. Those in the upper picture are plain contacts, while the lower set have ELMET facings.

Please ask for Publication No. 62.

**There is an ELMET contact metal for every purpose**



**PLAIN contacts: "three to four months was the maximum..."**



**ELMET faced: "...three and a half years of continuous use"**

**METRO-CUTANIT**

LIMITED GRAPPENHALL WARRINGTON LANCASHIRE

Broadway/mc6

Telephone: Grappenhall 906/8

TELEPHONE: CRETOWN 3626  
TELEGRAMS: PRE-CAST CRETOWN

The Solway Pre-Cast Products Ltd

DIRECTORS:  
D. MC GOWAN  
J. B. SLATER  
PRE-CAST CONCRETE SPECIALISTS & GRANITE CRUSHERS  
BARTHOLM Factory  
CRETOWN  
KIRKCUDBRIGHTSHIRE

7th August, 1959.

JSS/VK

Metro-Cutanit Ltd.,  
Grappenhall,  
WARRINGTON,  
Lancs.

Dear Sirs,

We have now completed the test run of the switch fitted to our electric hoist using ELMET faced contacts. It is approximately three and a half years since this unit was fitted. This unit has given no trouble whatsoever, lifting units between 17 and 18 cwt each.

and since fitting, this switch unit has given no trouble to our continuous operation since that date. This unit has been in capacity, lifting units between 17 and 18 cwt each.

and this is the first occasion that the switch has been inspected, when we removed same to return to Grappenhall.

Previous to your supplying this switch, three to four months was the maximum period before either dressing-up or renewal of the contacts was necessary. The contact failure of the original switch caused other troubles. The main switch is connected to one phase, as on this unit the magnetic brake is pulled in the magnetic contact faces, although there have been times when, due to burned contact faces, the main switch has been times when, magnetic brake was not lifting, although the motor spindle - due to this happening - we sheared off the end of the motor spindle - due to this contacts, it was attached. In fact, before the motor spindle to this running satisfactorily.

In closing, I would mention that immediately before removal of the ELMET-surfaced switch, the contacts did not show signs of slight burning but this is not excessive after three and a half hours per day.

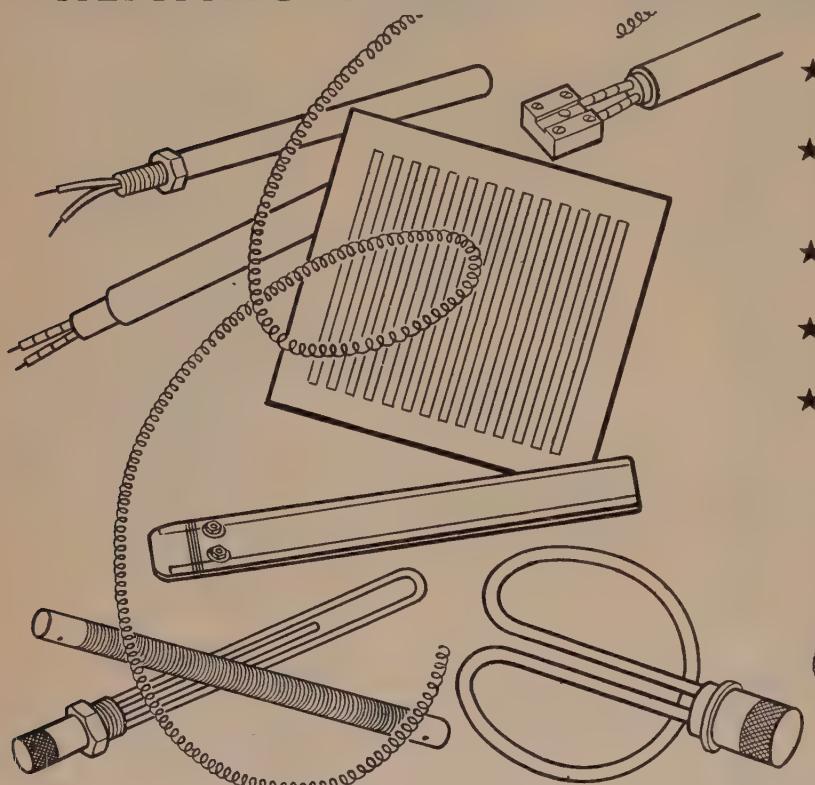
Thank you for your co-operation in this matter.

Yours faithfully,

J. S. Blutter  
Managing Director  
For THE SOLWAY PRE-CAST PRODUCTS LTD.

Manufacturers of

## HEATING SPIRALS AND FIRE ELEMENTS



★ SILICA GLASS TUBE ELEMENTS

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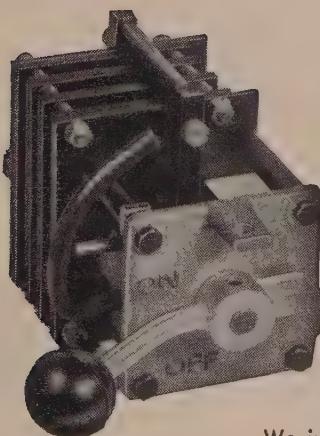
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mechanism.



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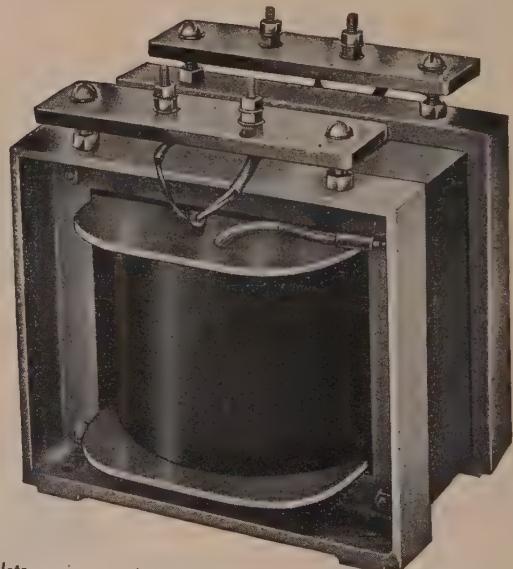
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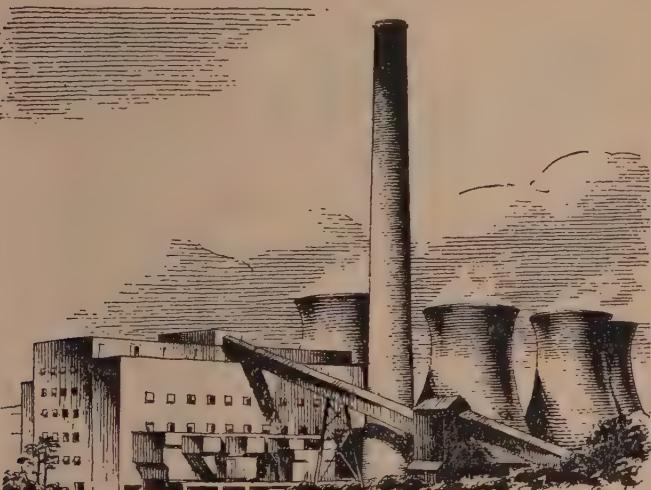


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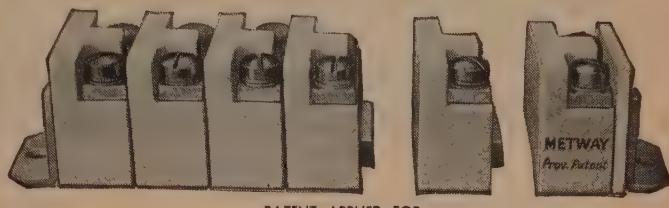
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CONSULT

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# "METWAY" TERMINAL BLOCKS

The largest range in the world!



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TERMINAL BLOCKS WITH SHROUD



INSULATED LINE TAPS  
5 AMP.-110 AMP.



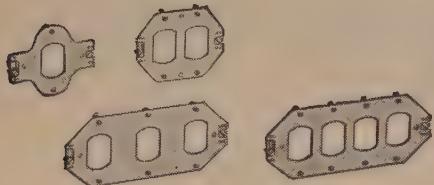
PLASTIC CABLE BANDS 2 $\frac{3}{4}$ " - 7 $\frac{5}{8}$ "

For details of all types, please ask for  
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...the most versatile switch of all!



*Switches up to twelve gang patterns can be assembled using only four grids.*



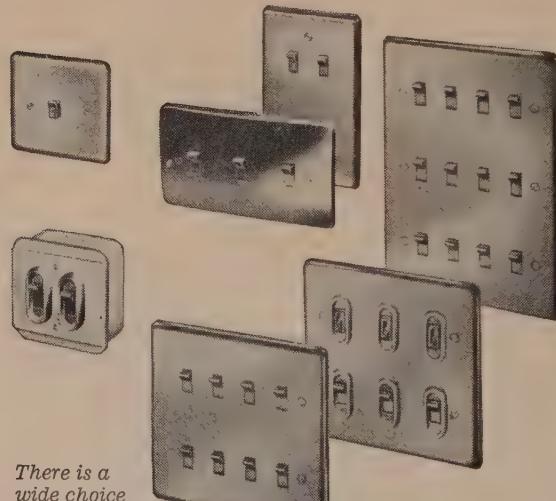
*The extensive range of interchangeable components includes 5 amp one way, two way and intermediate switches, 15 amp one way, two way and DP switches, secret key switches, bell-pushes and neon indicators.*

The Gridswitch is the answer to uniformity of appearance throughout the largest scheme. Standard components result in quicker installation and lower costs. Every switch matches: every part is interchangeable. Extensions and alterations are easier: maintenance is simple beyond words. The MK Gridswitch has made all this a reality in very many of the latest buildings.

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*Only five boxes are needed for the complete range of switches, whether mounted horizontally or vertically, on the surface or flush.*



*There is a wide choice of surface and flush plates for every type of installation.*



... the mark  
of leadership

**FRIDAY  
21 OCTOBER  
1960**

# ELECTRICAL REVIEW

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*General Editor:*  
**J. H. COSENS**

*Technical Editor:*  
**A. R. POLLARD, A.M.I.E.E.**

## IN THIS ISSUE

<b>Domestic Prospects</b>	<b>691</b>	A year ago domestic appliance sales had reached a record level. Government measures have since resulted in a slowing down of business, but as we are still far short of "saturation point" in the use of many types of electrical appliances this setback can only be temporary	
<b>Developments and Trends in Appliance Design</b>	<b>693</b>	Because of the accommodation problem in British kitchens, more interest is being shown in built-in or partly built-in equipment. Longer term developments are concerned with research in the study of materials	
<b>Adequate Installations</b>	<b>696</b>	Full use of electricity in the home continues to be hampered by lack of adequate installations. Fire and shock hazards are also involved through over-loading and the extensive use of adaptors and flexible cords	
<b>How to Sell Appliances</b>	<b>698</b>	In this article Miss Dorothy Taylor (Midlands Electricity Board) emphasises the value of effective grouping of appliances and of "on the spot" demonstrations	
<b>Outlook for Domestic Appliances</b>	<b>700</b>	Surveying the present position and problems of the industry, the author expresses the view that stability will be reached only after severe readjustment to meet a demand still expanding though at a lower rate than in the past	
<b>Electrical Appliance Approval</b>	<b>703</b>	The functions, method of operation and future plans of the British Electrical Approvals Board for Domestic Appliances are outlined	
<b>Appliances for the Home</b>	<b>Supp. I-48</b>	This illustrated review of present-day equipment is divided into sections covering cooking, refrigeration, space heating, water heating, laundry, cleaning, lighting and miscellaneous appliances, followed by a list of manufacturers' names and addresses	
◆ ◆ ◆ ◆			
<b>Views on the News</b>	<b>702</b>	<b>Generation and Development</b>	<b>717</b>
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VOLUME 167 NUMBER 17

Eighty-Eighth Year of Publication

FRIDAY

PRICE 1s 6d

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# ALL SPICK and SPAN WITH NEWSPAN

AT TESCO'S FOOD WAREHOUSE

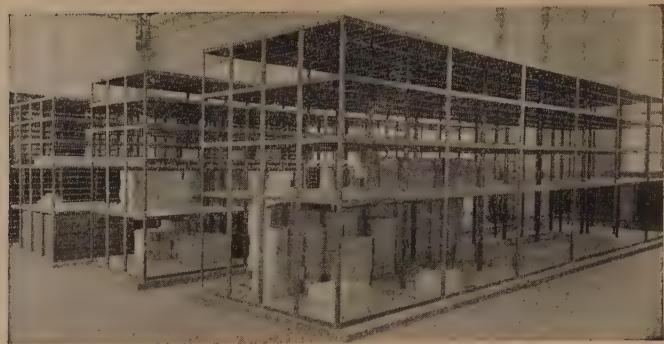


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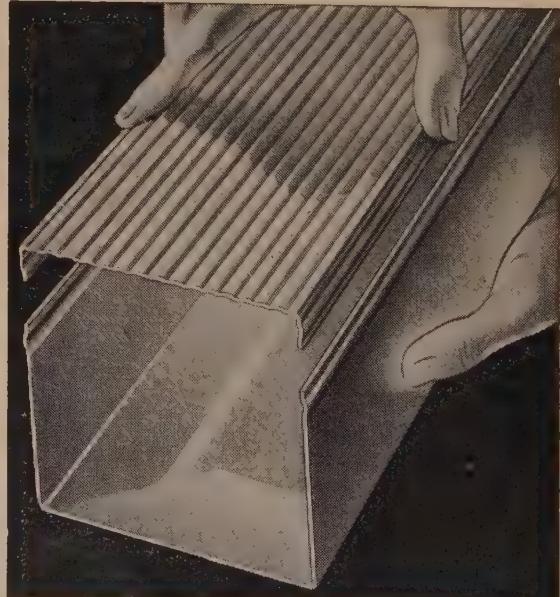
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# ELECTRICAL REVIEW

21 October 1960 Vol. 167 No. 17 Established 1872

## *Domestic Prospects*

SINCE our last Domestic Issue was published a change has come over the electrical appliance scene. Then the sales of domestic equipment were running at a record rate and most manufacturers were disposing of their products as fast as they could make them. The boom was largely the result of the easing of hire-purchase and credit restrictions late in 1958 and the reduction of purchase tax last year. Unfortunately the Treasury considered that the pace was too great for the health of the nation's economy and the brake was applied—too suddenly in the view of industrialists. As a consequence of the reimposition of onerous hire-purchase terms and the contraction of credit, upward movement was checked, with serious effects upon many manufacturers of domestic electrical appliances. The position was worsened by the fact that there had been an influx of newcomers to the business as well as an increase in appliance imports which the easier conditions encouraged.

Most of the trouble has befallen the makers of the more expensive appliances for which a 20 per cent initial payment and completion in two years are stipulated, e.g. washing machines, vacuum cleaners and refrigerators. Those appliances (e.g. cookers and water heaters) with a 10 per cent initial deposit and a four-year payment period have not been so badly affected: nor have the smaller items.

According to official statistics there has been no reduction of expenditure by consumers generally; what has happened has been a switch from the more expensive goods to lower-priced ones. We do not believe that the electrical appliance situation is desperate, as some alarmists in the industry would have us believe. We are convinced that at the worst any slowing-down is merely temporary, even if relief from h.p. restrictions and purchase tax is not forthcoming. For remember, we are dealing largely with necessities—a category into which more and more appliances fall as living standards are raised. In the matter of modern living we are inclined to look towards the American pattern and it is obvious that we are still far behind. Only in the appliances most commonly used in both countries, vacuum cleaners and irons, are we anything near the American "saturation" level. We also approach that level in the cases of cookers and water heaters, but those are not so extensively used in America as they will eventually be here. Therefore we retain the optimism with which we produced last year's domestic

issue, and we feel that in showing once again what equipment is available and what advances have been made in the past twelve months we are helping to stimulate an inevitable upward trend.

## SAFETY AND RELIABILITY

An appliance approval system for the electrical industry has long been contemplated as most desirable, if not essential, as protection not only for the customer but also for the manufacturer who produces reliable appliances which cost a little more than cheap but unsatisfactory equipment. There are proving houses already in existence which pass judgment on appliances submitted to them but they are somewhat localised or limited in their scope and have not impressed themselves upon the public's mind. It is admitted that, in a limited field, the "Kite-Mark" of the British Standards Institution has received a fair amount of public recognition; this has been achieved largely by emphasis on the mark by the manufacturers who are qualified to use it.

Publicity by the manufacturers is the principal key to the success of any approvals scheme and so it will be with the British Electrical Approvals Board which has made its first statement (dealt with on page 703 of this issue). The plans which the Board announces mark the beginning of a national organisation which should steadily get a hold on the public's attention: but it must first secure the manufacturers' support, which is what the Board is now setting out to do.

## A CAUTIONARY TALE

Members of Parliament have been promised an additional White Paper this autumn on the capital programmes of the nationalised industries. Arrangements are also being made to enable them to discuss these plans in more detail and at an earlier date than has previously been possible. The desire by M.P.'s to exercise a closer scrutiny over public expenditure to which they are giving their approval is estimable and entirely justified. But in the case of the electricity supply industry, at least, it is difficult to see what can be achieved by this extra control; and the consequences of arbitrary amendments to the programmes at a late stage, or a delay in their approval, could be serious.

The investment programmes for electricity supply are designed to meet steadily expanding consumer demands and cannot be turned on and off to suit other considerations. Because long-term contracts are involved, the Generating Board's capital expenditure for the coming year is almost entirely committed by the time the annual White Paper is published. Though not quite so inflexible, much of the Area Boards' investment is also largely determined by circumstances outside their control. Demands for new supplies cannot be avoided and the result of past restrictions on capital expenditure has been that "the bones of the distribution networks are almost showing through

the skin." Ironically, this situation is an important factor limiting the extent to which investment in the supply industry can be used for "pump priming" to stimulate the economy in time of depression. As Mr. Ronald S. Edwards, a deputy chairman of the Electricity Council, points out in an article in the current *Lloyds Bank Review*, the electricity supply industry is itself among the first to feel the effects, in increased consumption, of any such exercise. Thus the industry's capital investment can only be subsequently reduced or slowed down if there is sufficient distribution capacity to meet the new requirements. It may, as this year, have to be increased.

## TOO-HIGH TEMPERATURES ?

According to a report in the 3rd October issue of the *Electrical World*, an apparently retrograde step is being taken by American power plant manufacturers and operators. They contend that in view of the high cost of austenitic steel its use cannot be justified in the future, and this will make it necessary to reduce operating steam temperatures from 1,100°F to 1,000°F. Steam pressures up into the supercritical range will still be employed, but obviously these plants will not show such high overall thermal efficiency. The Americans say that boilers with austenitic steel components have limited endurance in the 1,100°F range and above.

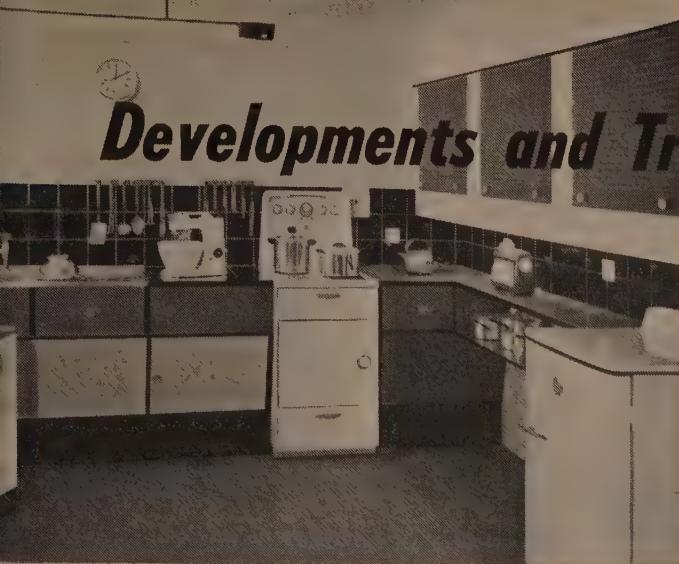
At the World Power Conference in Madrid earlier this year, Mr. Philip Sporn warned Great Britain against over-optimism based on early trouble-free operation. At present, we have no plant operating at above 1,050°F but, as Dr. J. M. Robertson said in his article "Metallurgy in Large Turbo-Generator Design" published in last week's issue of the *Electrical Review*, steps in the direction of higher temperatures are now being taken.

## ELECTRICIANS' WAGES AGREEMENT

Stabilisation of wages for a period is a consummation devoutly to be wished by any industry, for too much time and effort are nowadays consumed in practically continuous wage negotiations. Therefore it is good news that the contracting section of the electrical industry has arrived at an agreement, to operate from 1st January next, whereby wages will remain at an agreed level for two-and-a-half years (see *Electrical Review*, 14th October, p. 675). This arrangement has been made acceptable only by the granting of a substantial increase (18-19 per cent) upon the higher rates already coming into force on 1st November. There is provision for possible variations according to the rise or fall of the cost-of-living index.

One matter which has been the subject of dispute for some time is the payment of special rates on particular sites and for abnormal conditions. Under the new agreement these special payments are abolished. Overtime rates are also being revised.

# Developments and Trends in Appliance Design



After showing that domestic appliance design is a worthwhile career for the young engineer with the necessary aesthetic judgment, the author mentions a number of recent developments with great promise for the future, including several new materials having special characteristics

## New Ideas and New Materials

By  
H. C. TIMEWELL

General Manager,  
Domestic Appliance Division,  
English Electric Co., Ltd.



**T**HREE are over seventy categories of domestic appliances on sale in shops today. Sub-divided into the number of model variations, voltage specifications, colour and so forth, the total would add up to several thousands. Such is the ingenuity of the manufacturer constantly on the search to bring in new ideas and improvements which will gain for him a temporary lead in this highly competitive industry.

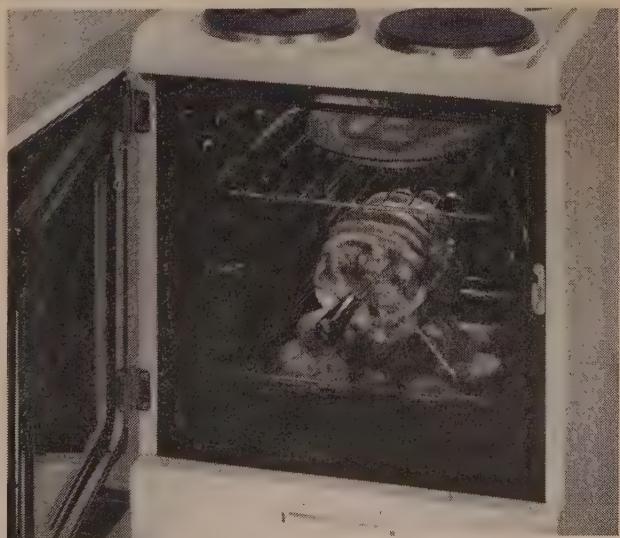
Within the compass of this brief article it would be impossible adequately to comment upon the widespread applications, which may vary from drying the freshly shampooed hair to satisfying the unscientific hope of storing ice cream in the domestic refrigerator. But the important point is the inventive skill being devoted to such uses and the tremendous scope for engineering design talent.

The design of domestic appliances as a serious subject and a career is only too frequently disdained by the young engineering graduate eager to associate his name with some spectacular project in which, incidentally, he would soon find himself a fairly obscure member of a large team. The development of an appliance is essentially a task for the individual, aided, of course, by laboratory assistants, draughtsmen and appearance designers. But none the less, the successful emergence of a product into manufacture is due largely to the individual effort. The appliance design engineer can rightly claim that the product is "his." He and his small team quickly derive satisfaction of accomplishment, and are able to see the results of their labours on sale, with the knowledge that it is in use in many countries.

The appliance development engineer must possess a pretty catholic knowledge of all kinds of materials, their cost and function, and how best to use them in production. He must be both an electrical and a mechanical engineer.

He must know too the capabilities of the production plant where he is working. Although aided by the appearance designer, his aesthetic judgment must be sound. Such men are urgently needed by the appliance industry and it is to this type of man that we look when compiling this annual review of progress and trends in the domestic appliance field.

Having disposed of this brief plea to young engineers who may be tempted to read this article, what has this year produced and what are the trends? The answer may be condensed into one word—"automaticity." A horrid word in our new vocabulary, but it epitomises the



Automatic rotating spit fitted into an electric cooker (the Creda "Rosta-Spit")

domination of automatic features and the trend towards even further methods of control with the minimum of human effort and thought.

To select a few examples: the time-controlled electric cooker has become an accepted specification, the sales of which exceed non-automatic models. A further elaboration is the introduction of automatic rotating spits in the oven. Thermostats controlling pan temperatures and fitted to boiling plates will become more widely used: no need to watch the boiling milk. A washing programme for fully automatic washing machines has made its appearance, designed to cover an extensive range of synthetic and natural fabrics. This takes the guessing out of washing. Automatic defrosting of refrigerators is still confined to larger cabinets for reasons of cost, not techniques, and "instantaneous" water heaters are more automatic and faster. The spectacular rise in the use of electric shavers is another example of automaticity, slicing its way through the nation's beard. One manufacturer has made history by producing an electric shaver at a price which is within the reach of all who shave.

Cooking, cooling, washing dishes and washing clothes, drying, heating water and heating rooms, boiling water, percolating, frying eggs, cleaning rugs and trimming hedges are all, in varying degrees, automatic operations. Most of these applications owe their origins to the United States, where domestic help disappeared a quarter of a century ago. This is not an indictment against ourselves but the stark fact of economics (the supply and demand for labour) overtaking the United States in advance of this country. Now that we are in the thick of our social

revolution which has placed the reluctant male squarely in the kitchen, we may expect more design originality from our own resources.

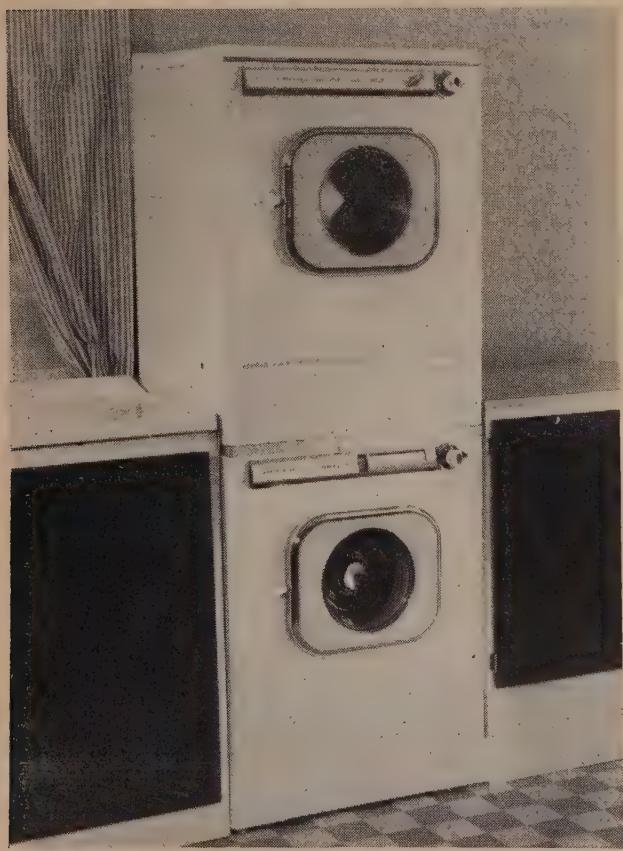
In the immediate future the trend will be towards more refinements, with more interest in built-in or partly built-in equipment. The British kitchen presents an almost insoluble accommodation problem for all the different types of appliances pouring out of our factories. After all the propaganda directed towards architects and planning authorities, it seems incredible that we continue to build a kitchen as a space surrounded by doors and windows. Within these sixty or seventy square feet of floor area and walls punctured with doors and windows, room must be found for all these automatic aids for leisured living. "Built-ins," "under-counters" and "wall hangers" offer one line of solution. A more extreme approach is in the so-called "exploded" house where appliances are built-in and sited where they are required most. It has been demonstrated time and time again that it is possible to fit in everything that the modern home requires within a space of eight feet by ten feet provided that the wall space is planned. It was once said that the British Empire was founded in a state of absence of mind. Perhaps this remark could be more aptly directed to those who build houses. A word of warning to the would-be kitchen planner: a rigidly built-in kitchen, like a mural, is immutable. So allow for flexibility to keep pace with new developments.

### New Materials

The longer-term trend must lie in further research and study of materials. We are not self-sufficient in steel production. In an expanding economy, a high proportion of steel has to be imported and this, as we are only too acutely aware, upsets the balance of payments. Great strides have been made, especially in the refrigerator industry, to replace steel with other materials. Much remains to be done in the application of ceramics. Research into semiconductors has awakened interest in the Peltier effect, exemplified in thermo-electric refrigerating systems. Bismuth telluride is the material currently used to exploit this phenomenon, and one company has announced that it will make small refrigerators operating on this principle of heat exchange. Virtually regardless of cost, the Americans have carried this development to the stage where they are air conditioning nuclear-propelled submarines by batteries of thermo-electric cells.

Freon-blown polyurethane insulation offers a good future in refrigerator cabinets. It has half the heat-transfer rate of the more common materials thereby enabling the designer to build a cabinet with thinner walls and gain more storage capacity. Resin-bonded fibreglass is being used more extensively, as, for example, in centrifugal spinners where it replaces vitreous enamelled steel. For strictly domestic purposes, research into ultrasonics has not yielded results that could be claimed as a big improvement over conventional methods, but investigations continue. In the field of electronics, microwave cooking has distinct advantages for large-scale catering, and for the quick defrosting of frozen foods. Irradiation is another development—and a controversial one from the biological point of view.

In fact, the rapid developments that are taking place in the food industry will largely dictate the shape of



Fully-automatic washing machine and clothes dryer (English Electric "Liberator")



Built-in cooker unit which enables the oven and separate hob to be placed where wanted (Tricity Cookers)

things to come. A good instance is the quick freezing of foods. More sub-zero storage space must be provided in domestic refrigerators and this will determine evaporator design and methods of control. The consumption of soft drinks is increasing enormously, and for palatability, soft drinks must be chilled. In the textile industry new synthetic fabrics are appearing almost daily. These fabrics must be washed, dried and sometimes ironed. All this affects the development of specific appliances.

The oft-repeated criticism that the British housewife is a bad cook compared with her Continental sisters is now working to our advantage. Our food industry in its packaged form and pre-prepared and wholly cooked foods is well ahead of its European rivals. So while the French housewife busies herself with concocting menus literally plucked from the ground, our women must have all the automatic apparatus to store and to cook our manufactured foods.

The progress of our industry is measured in monthly statistics and it is indeed interesting reading to note, for example, the millions of people who now climb into heated beds—again, an automatic heating process. But there is one other significant piece of evidence—electricity consumption. During the year 1958-59, the sale of electricity to domestic premises increased by 12.8 per cent over the previous year. The increase for industrial purposes was, by way of comparison, 2.5 per cent. The appliance industry is obviously the most potent factor in this increase.

The future is exciting, with its promises of easier and quicker ways of doing things in the house. The prizes are there for the mentally alert designer who is looking ahead of the changing social pattern. During the year the industry has attracted many newcomers—some with famous names in other fields, and others with little or no experience of appliance design. This facet of our affairs is encouraging inasmuch as it denotes the growing importance of the industry, therefore it is indeed timely that a National Approvals Authority has been established to help the manufacturer and to safeguard the consumer.

## **DOMESTIC EQUIPMENT SUPPLEMENTS**

As regular readers are aware, information with regard to the more widely used items of domestic electrical equipment is published at regular intervals in the *Electrical Review* in the form of self-contained detachable supplements. The next in the series, dealing with electric cookers, will be included in next week's issue. The data, in tabular form, will give details of the size, oven loading, number of hotplates, special features, price, etc., and will be accompanied by illustrations of many of the current models.

# ADEQUATE INSTALLATIONS



By  
**E. E. JACOBI**  
M.I.E.E.

*Technical Director,  
Troughton & Young, Ltd.*

Convenience is one of the principal attributes of electricity but it cannot be said that the majority of domestic electrical installations are either convenient or adequate. The author points out that raising the standards of installations would encourage even greater progress in domestic electrification

## Making the Best and Fullest Use of Electrical Service

OVER the years much has been written in regard to electrical installations in domestic premises. During the period between the wars, many people had given consideration to the design of the domestic installation and it came to be realised in the early 1940's (even though the country was fighting for its very existence) that we would be faced with a very large housing problem and, by implication, the provision of hundreds of thousands of electrical installations immediately the war had ended.

With an optimism not so apparent at the time, but nevertheless amply justified, the Institution of Electrical Engineers invited the presentation of a paper on "The Future of the Domestic Wiring Installation" which indicated very clearly the trends of that time. It was published in the *Proceedings* in December, 1943. This led to the preparation of the Post-War Building Studies with especial reference to No. 11: Electrical Installations, published in 1944, in which reasonable standards of installation were put forward. Unfortunately, the exigencies of the post-war period prevented the full and immediate development of many of the points made, although in looking back it is surprising to find how many of the ideas then put forward for future consideration were in fact adopted and have become standard practice.

In the last decade adequacy has unfortunately tended to become synonymous with extravagance and in holding the view, quite correctly, that the country could not afford extravagance in its housing programme, the tendency has been to limit severely the extent of domestic installations. Thus, in avoiding extravagance, installations have become inadequate. Further, it is apparently one of our national failings to be unable accurately to look into the future; or perhaps we have been conditioned by the necessity for economy for so many years that to be economical in provision for the future is now an ingrained habit.

One has only to look at the road system or the railway system of the country to see the result that many years of failure to look forward have caused. The irony of the position is that ultimately it is necessary to make up for the deficiencies of the past at vastly increased cost, as a necessity of self-preservation, and to keep up with our foreign friends. The provision of adequate domestic installations may not directly aid such self-preservation, but efficiency at home (whether we mean *in* the home, or

at home in this country) will eventually assist our general efficiency and hence help us to maintain our position in the world.

### Health and Safety

Adequacy must also have reference to health and safety in the home. About 3,500 people die during the year from falls in the home, 25 per cent of these being from falling downstairs. Many of these accidents must be attributed to lack of artificial light or the inadequacy of switching.

As with light, so with heat; where facilities exist, electric heat can be used cleanly and efficiently. Otherwise, appliances using solid or liquid fuel must necessarily be employed and these in certain circumstances can produce soot, fumes and dirt; the cost to the nation of these effects, translated into terms of illness and absence from work, must be very high. It is evidence of the difficulties of this situation that it has been necessary to pass a Clean Air Act, but that it is taking years to implement its provisions.

In an attempt to remedy the domestic situation, the Institution of Electrical Engineers arranged a symposium on "The Provision of Adequate Electrical Installations in Buildings," during 1958. Different authors expressed different ideas, but here again the point of view taken by an author representing a public authority concerned primarily with the economics of rent, differed considerably from that of the private individual, in formulating the limits to which an installation should be provided.

### Socket-Outlets and Other Services

In much of the discussion that has taken place on this subject and particularly in the discussion following the I.E.E. symposium, it has been taken for granted that the only criterion of the adequacy of an installation rests in the number of socket-outlets provided. Socket-outlets are, of course, the obvious and outstanding feature indicating the adequacy of an installation, but many other matters deserve equal consideration. To name only a few:—The arrangement and extent of the lighting, having reference both to the number of outlets and the lighting equipment; the provision of effective two-way switching (a subject still not given sufficient consideration); the

capability of extension (even with the ring main socket-outlet system comparatively little advantage has been taken of the possibility of introducing new outlet points into existing rings, insufficient thought having been given for this purpose to the design of both the wiring installation and of the structure).

### New Requirements

Future trends are also most important, although a complete allowance for possibilities may be problematical and could involve unnecessary cost. Two examples spring readily to the mind: first, the rapid increase in the number of all-electric central heating installations with especial reference to off-peak under-floor and similar methods. Here the emphasis must be on the design of the structure, it being obvious that it would be foolish to provide special circuits of this nature that might never be used. The second example, of which one can already see the outcome, is television. It is still rare to find provision for television in the structure of an individual domestic dwelling (although the situation is better in blocks of flats, especially of the more expensive type) and even less provision is made for the use of television in more than one room.

So far as the more usual equipment is concerned, as, for example, electric cookers and immersion heaters (these equipments being particularly mentioned as they are substantially fixed items and of large electrical capacity), a proportion of installations do admittedly allow for their future use, even though they are not required in the first instance; but where such allowance has not been made, it is very difficult to provide for them at a later date.

Another very severe result of lack of adequacy is the increased possibility of fire and shock due to the over-loading of cables and wiring accessories (any length of wiring can be overloaded if the fuse is made sufficiently strong) and, secondly, the possibility of fire due to the extensive use of adaptors and flexible cords. There is a further implication—that such adaptors and flexible cords will be bought and installed by "amateurs" and that both the quality and method of installation will be sub-standard.

### Electricity Service

There can be little complaint in these days in respect of the electricity service. Most of the service cables and terminations provided are adequate for the present and future normal loads of a house, and the same can be said of the modern consumer's unit which provides reasonable protection of the installation at an economical price.

Immediately after the first world war when the consumption of electricity began to expand, the amount of electricity generated was of the order of 3,000 million kWh per annum; this increased in round figures by 10 per cent per annum and has now reached 100,000 million kWh. It is reasonable to assume that the part of the energy output concerned with the domestic installation has risen in much the same proportion. This means that in respect of current-consuming appliances used forty years ago, thirty times as much energy is being used today; in fact, the proportion may be higher by reason of the increased efficiency of modern equipment.

The number of appliances for plugging-in for daily use

in the home, as supplied by British manufacturers, excluding lighting fixtures and lamps, is averaging fifteen million items per year for use in this country only. This does not include items of imported equipment, and when these and floor and table lamps are included, it would be fair to say that between four and five new current-consuming devices enter every home every year. Where they take the place of old ones, the latter are not necessarily scrapped—they may still be kept in use.

The figures for percentage saturation of appliances given by an I.E.E. panel to a questionnaire issued by a Sub-Committee on Housing Standards of the Ministry of Housing and Local Government show that in the twelve years between 1946 and 1958 the number of appliances in use multiplied by three, but even so, the saturation figure for each appliance (some are more and some are less than others) averages only 25 per cent.

Who would have guessed only a decade ago, that washing machines and television sets would be standard in every home; and who can guess what new equipment will become standard within the lifetime of houses now being built—nay, within the next decade?

There is no doubt that the yearly increase in the use of electricity will continue, and that the cause of the increased consumption is necessarily the equivalent increase per annum of equipment used. The position with regard to domestic labour would alone create this necessity. Unless the means of connecting the equipment are available either the sales of equipment will go down, or, alternatively (and the more likely), more and more adaptors and flexible extensions with their attendant risks will come into being.

These notes on the subject of adequacy may finish as they started, by indicating that much that has been written and said on the subject of adequacy has been negated by the need for economy and the pressure of economics during these post-war years, but it is hoped that as those years pass and general conditions improve, the situation may be restored and allow full advantage to be taken of the benefits that the use of electricity can give.

### Medium-Voltage Oil Circuit-Breakers

THE British Standard for oil circuit-breakers for medium-voltage a.c. systems, B.S. 936 : 1960, is a revision of the war emergency (1940) edition. The standard is now generally in line with other specifications for switchgear—such as B.S. 116 and B.S. 3078. The requirements for making and breaking capacity and short-time current tests have been revised with the object of formulating what has become established as good practice in the technique of making the tests and assessing the results to achieve the greatest uniformity.

The standard applies to three-pole circuit-breakers suitable for use on three-phase industrial and supply distribution systems having voltages up to 660 V and breaking currents not exceeding 43.3 kA. The circuit-breakers are intended for use in those parts of a system where marked asymmetry in short-circuit currents cannot occur and where short-circuit operating duty requirements and restriking voltage conditions are less severe than those envisaged for circuit-breakers complying with B.S. 116—the standard for oil circuit-breakers for a.c. systems. Copies may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 15s.

# How to Sell Appliances

From her experience as a demonstrator Miss Taylor produces a number of suggestions for arousing the interest of visitors to electrical service centres and for the arrangement of displays and demonstrations of appliances

By DOROTHY TAYLOR

Principal Assistant,  
Chief Commercial Officer's Dept.,  
Midlands Electricity Board



## Advice on Displays and Demonstrations

**A**LTHOUGH there has been a marked increase in the sale of domestic electrical appliances during the past few years, the "saturation" figures published from time to time showing the number of electric cookers, refrigerators, washing machines, etc., in use in the homes of Great Britain reveal that there is still a large potential market. The fact that there has been a much more general acceptance of so many of them in the homes of today, will undoubtedly have a "snowball" effect and cause more to be sold, especially if the owners have been satisfied with their purchase.

Present-day advertising, in particular that on television, has proved to be an effective way of arousing people's interest in electrical appliances, amongst other things. We know it is responsible for bringing many people into our service centres and shops, and will probably continue to influence the public in this way. However effective TV advertising may be it is a great mistake to just sit back and think that it will do all the work for us. It won't. Not everyone sees the advertisements, even if they have a TV set.

It is just as big a mistake, too, to adopt the attitude that it is only the appliances advertised on TV which are any good, or need to be stocked. By this, I do not mean that all such goods are unsatisfactory, nothing could be further from the truth, but as one would expect, some are, of course, better than others. After the customer has come into the service centre, shop or exhibition as a result of these announcements, it is up to the salesman, or saleswoman, to sell the best appliance to suit the customer's individual needs. It is only by personal contact that these can be ascertained, and the salesman who knows his products, and is enthusiastic about them, will have the greatest measure of success.

To find new ways other than the one mentioned of attracting people's attention and arousing their interest in electrical appliances is not easy. It means that the sales staff must be constantly looking out for, and trying, new ideas. When a sales campaign for a certain appliance or range of appliances is being planned, a greater measure of success is likely to be achieved if it is linked up with current local or national Press and TV advertising, or with seasonal or topical events. In addition, all the publicity possible should be arranged for the campaign by such means as attractive posters, or window displays, and good, clear-cut displays with showcards inside the centre "spotlighting" the appropriate items.

This may all sound very elementary and too obvious to warrant a mention, and yet, unfortunately, one too often sees in travelling around the country that little or no attention is paid to such detail. Not only is national and local advertising often ignored, but also we have all failed at various times to find displays of refrigerators and fans during a heatwave, and have been unable to see drying equipment on show during long rainy spells. Once in a while a great effort seems to be made in this direction, but the greatest success is likely to be achieved when this is a routine weekly effort and not just an annual or bi-annual affair.

The simple but attention-attracting grouping of appliances within the service centre or shop is one which does not always receive the attention it deserves. There is nothing worse than the salesman—and perhaps the customer, too—having to walk hither and thither before finally "spotting" a range of three or four kettles, irons or perhaps even toasters, shavers, etc. The arrangement and grouping of the appliances, with appropriate notices or showcards, can be a positive aid to selling. The type of notice or card which will attract the most interest and attention is the one which gives the message simply and clearly in as few words as possible. The story we want to tell is the one which will dispel any doubts a customer may have previously had about this particular appliance.

A good example is the mistaken idea some people still have that electricity is slow and inflexible, or that the oven is small. To focus attention on the new fast boiling plates, and the simmer control giving any heat from the lowest simmer to fastest boil, or the large oven with its interior light, etc., will be much more effective than platitudinous generalities.

### "On the Spot" Demonstrations

However good a display may be, its effectiveness can be enhanced from time to time by some kind of animation. The simplest way to do this is usually to give some "on the spot" demonstrations using some of the appliances. The frequency with which this should be done to ensure the maximum success will, of course, vary from one locality to another and any specially busy periods or days like Saturdays or market days are likely to produce the best results. When staging a demonstration of this type in a shop or service centre, the position should be well chosen—a good one may well be en route to the cash or inquiry desk.

Having planned these demonstrations to tie up with the publicity it is as well to bear in mind that it is of little use anticipating or hoping that it will be possible to hold most people's attention and interest for more than a couple of minutes or so. Therefore, I suggest that the demonstration should be quick and exceedingly simple. It is much more likely to succeed if a single idea is put over in order to arouse interest. Too many ideas in a comparatively short time are likely to produce confusion and no positive results.

Very often, a "gimmick" of some kind will succeed in attracting attention and will give an opportunity of afterwards showing or telling the "prospects" about the real item which it is your intention to spotlight. One which has been used over the years, and never seems to lose its effectiveness, is the pleasant aroma of coffee percolating during the morning. If it is possible to serve interested-looking customers with a cup, so much the better. If the speed of the hotplates is to be the theme, the milk for this coffee could be kept hot at a low simmer in an attractive saucepan with easy-to-pour lip. The plate could be switched up when necessary to show how fast it will boil. The slow simmer and fast boil will both be illustrated in this way. Another "old faithful" is to have a pan of soup simmering on a hotplate—the attractive aroma on a cold day ensuring interest—and again demonstrating the slow simmer.

Another very effective on-the-spot demonstration which is being carried out with a fair measure of success at present is that of using one of the very fast boiling kettles to produce a cup of "instant tea."

It is sometimes found that people are more willing to have a cup of coffee or tea, or even to just look and listen on their way out of the shop, than on the way in. This, I think, is a matter for experiment and will vary in different places. These short, snappy demonstrations can be used to not only draw attention to the kettles and percolators, but any other major items. Another obvious example would be the dishwasher which could be used to wash up the cups and saucers. I do, however, make a plea for short, slick demonstrations which are clean and tidy, and that the effect is not spoiled by obtrusive shopping baskets and handbags which are so often far from being invisible to the spectator, or by dish cloths and tea cloths which are far from white. Electricity is clean and so everything which is being used should be spotless.

### **Importance of Preparation**

The majority of people today appreciate the fact that the baking performance of an electric oven is good; therefore more time and effort can perhaps be profitably spent in showing the speed and effectiveness of boiling plates. If, however, for some special reason, baking is to be carried out, it should be simple and the bulk of the preparation should be done beforehand; everything possible should be in the refrigerator, such as cookies which only require cutting, or biscuits or pastry which have previously been made with the aid of a mixer. There is nothing worse than a table cluttered with flour and sugar bags, rolling pins, etc. It is a most difficult task and often a very unsatisfactory one to try and make cakes, pastry, etc., when constantly being interrupted to talk to customers—and it is the demonstrator's job to talk to them.

Greater benefit can more often be obtained by means of a carefully prepared and attractively presented display of perfectly cooked food. Often the most satisfactory idea is to choose food which has a good aroma, will look attractive without requiring attention, and can be viewed by passers-by through the glass door of an oven having an interior light. The roasting of boned and rolled pork on a rotary spit is a good example of this.

### **The Home Laundry**

It is sometimes difficult to think of new ideas for arousing interest in electrical laundry equipment; most things have been tried at one time or another. I personally am in favour of simple demonstrations which can go on for a whole day if necessary without losing their effectiveness. With a washing machine one so often has the problem of lack of adequate and convenient water supplies and drainage in a showroom or exhibition, and most people know today that an electric washing machine really does wash clothes clean. Having the tub filled with dirty soap suds after the inevitable dirty towel has been constantly washed will prove very little to the discerning customer. A more practical idea is to have a few clothes of mixed colours moving around in clear, clean water. Practically all machines have heaters today, so the water could be made luke-warm and kept at that temperature. This can last the whole day if necessary and will clearly demonstrate the washing action. The customer will then be able to see quite clearly that the action does not cause "tangling" nor is it "wishi washy."

The effectiveness of the tumbler dryer can be shown by means of a few coloured and white towels or suitable clothes. The most effective way of demonstrating a spin dryer is generally by means of woollen garments. Another useful "gimmick" is the guaranteed washable toy of which there are many attractive models available. These can be put in a washing machine, or in a spin or tumbler dryer and arouse unbelievable interest. There are many more ideas one could mention if space permitted.

Many electrical appliances are very simple to use, and it is not necessary nor indeed is it practicable to try to give after-sales advice and service to every customer who has purchased a major item of electrical equipment. A very high proportion of these customers, especially in the towns and cities, may be out at work and very difficult to contact. This problem of after-sales advice and service is generally a difficult one. Some equipment manufacturers have trained their own sales representatives to give this when the equipment is delivered.

Current practice in this matter seems to vary from district to district. Frequently prepaid postcards or letters are delivered with the equipment sold by the Electricity Boards, giving information about the housecraft advisory service available, upon request. The number of requests varies considerably and, of course, it is often said that the people who require the most help are generally the ones that don't ask for it. I feel that this problem is lessening today, as cookers and other pieces of equipment become more widely used and known. It is probable that as the design of equipment improves still further and becomes increasingly simple, this service may diminish. In cases where the after-sales advice is given, the fullest opportunity of visiting the consumer in her own home must be taken advantage of and whenever

possible seeds sown for the purchase of other equipment which will help her with her problems still further, including water heating and space heating appliances.

Many of the ideas which have been mentioned in connection with giving on-the-spot demonstrations in service centres can be easily adapted for exhibitions and they can frequently be incorporated into lectures and demonstrations. When giving lectures and demonstrations to the public, great care should be taken to choose subjects which are topical and suitable to the audience. If this can be linked up with seasonal or topical events even

greater benefit will result. The one point which I feel should be remembered is that the advertisements describing the appliances often emphasise some of their main features; the job of the demonstrator in giving her demonstration is to prove these points, showing the benefits which will be obtained by using and owning the appliances in question.

The one ingredient which is necessary for every demonstration or sales talk I have mentioned is enthusiasm —this, combined with a good knowledge of the products, will inevitably bring about increased sales.

## Outlook for Domestic Appliances

Unprecedented expansion in the demand for domestic electrical appliances in the past decade encouraged existing manufacturers to extend their capacity and brought in many newcomers. Excess production was the result and the reimposition of financial restrictions created serious overstocking. The author thinks that stability in the industry will be reached only after severe readjustment to meet a demand still expanding, though at a lower rate

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### FACTORS GOVERNING HOME AND EXPORT TRADE

**T**HE market for the larger domestic appliances is in a mess and a mess of the industry's own making. The outlook for the industry is conditioned by its immediate past and the immediate past is a tangle of unregulated growth that will make for great difficulties in the next year or two. With adequate statistics these difficulties might never have arisen and the good that will emerge is that increasingly the industry will come to recognise the need for, and take steps to provide itself with, information which will enable it to control its affairs instead of sailing headlong into the weeds at intervals. The smaller appliance markets (saving TV and radio) have developed more steadily, but the rough and tumble of really competitive selling has not hit them yet and the years ahead for them are likely to be hectic. The 1950's saw a vast but not unforeseeable expansion in the larger appliance field. The number of consumers who could bring refrigerators and washing machines and other appliances within their sights grew rapidly as steady employment enabled them to plan their lives and wartime shortages were made good.

A real bonanza was evident by the beginning of 1959 and manufacturers and retailers joined in the rush to profit. Existing manufacturers expanded capacity, new manufacturers joined the rush, long-term contracts were entered into for the importation of foreign-made appliances and more retailers began to handle appliances under the pressure of the good news that the Press, manufacturers' representatives and fellow retailers brought them.

Deliveries during this runaway period were supplying the consumer and providing trade stocks. It is interest-

ing to speculate on the extent to which that part of deliveries which was for the provision of trade stocks was recognised by manufacturers as a non-recurring component. By the winter of 1959 these stocks were at least adequate, and possibly more than adequate, for the existing level of consumer demand, but fresh outlets continued to enter the field and total stocks rapidly rose above the justifiable level. As a result the individual retailer's sales began to fall as he shared the available business with increasing numbers of other retailers. Before the year's end a trickle of retailers began to sense a down-turn in the volume of their business and measurements of trade stocks suggested inevitable trouble for some manufacturers and many retailers by mid-1960.

The raising of the bank rate added to the retailer's problems by increasing the cost of financing his inflated stocks while the pressures arising from manufacturers exploiting their increased capacity and importers unloading their shipments continued to extend distribution still further. With an overstocked pipeline and without noticeable setback in consumer demand retailers individually and manufacturers collectively experienced a recession of business, due in the former case to a watering of the market and in the latter case to the fact that 1960 business had been sold in 1959. A temporary hiatus in consumer demand as a result of the change in hire-purchase regulations aggravated the position.

For the retailer the initial problem was one of de-stocking under the pressures of the rising cost of financing stocks and a watered rather than diminished demand. A natural reaction was overt price cutting,

trade-in deals, "end of season" sales and the selling-off of "discontinued lines."

Many retailers will regret their temporary intrusion into the market and withdraw permanently, with a consequent improvement in business for those who are left. Whether it is consciously realised or not, retailers will have to compete with one another for a share of the market and the net effect will probably be the strengthening of chain stores and larger retailers and the prizes for those who stay the course will be great. The strong card of the smaller man—his ability to provide service—is being abandoned to the manufacturer.

Retailers will increasingly engage in advertising and promotional activity in conjunction with manufacturers and take the initiative in the matter to a much greater extent than they have done in the past. In these circumstances the discount house may have to delay its appearance until the retail trade itself has established the breakdown of the price structure and thus developed the habit of shopping for appliances among consumers. In more settled conditions, the discount house can then offer marked competition with the more regular outlets.

The big chains may consider entering the manufacturing field—opportunities for buying or employing capacity are likely to appear in the not-too-distant future.

The manufacturer will face the prospect of diminished deliveries until such time as the retail trade has corrected its stock position. Indeed, the period of recession may be prolonged by an over-cautious attitude on the part of the retailer which will lead him to keep his stocks at a lower than necessary level until very definite signs of recovery appear. It is unlikely that any but the smaller manufacturer will withdraw from the market voluntarily and a struggle for volume will be on.

There will be pressure on profit margins and margins must be maintained by serious efforts to cut manufacturing costs if the industry is to ensure its vitality which will depend upon its ability to invest in new development and design. For a time increasing difficulty will be experienced in the enforcement of resale price maintenance and permanent weakening of this part of the trade structure may occur. Amalgamations, mergers and groupings will take place in an effort to employ capacity efficiently and ensure economic runs. Such activities may be directed toward acquiring capacity competitive to one's own product or diversifying the product range.

### The Search for Stability

As in the '50's the major effort of the manufacturers was directed to the building of production so in the '60's it will be switched to marketing. The consumer is likely to go on buying at a fairly steady rate unless there are sharp increases in price because of purchase tax changes or steep rises in the cost of labour or materials. It would appear probable that the days which saw a high rate of growth are over because of the impending crystallisation of the distribution structure and a natural slowing down of the rate of increase in consumer demand. This factor will help the industry in its search for stability. With this stability the need for State interference in the price and conditions of sale of appliances will diminish and distortions of demand about Budget time, which were a feature of the '50's, will disappear.

With this background we may look at the export pros-

pects. There is probably excess refrigerator capacity for the present rate of consumer demand and the existing capacity is likely to be able to cope with any home market growth in the foreseeable future. This is almost certainly the case for every refrigerator producing nation as the total capacity is probably greater than the world's needs. For the producing countries the economics of taking in one another's washing is not likely to be any more rewarding in the field of domestic refrigeration than it is elsewhere. It is not to be expected that the under-developed countries will provide any substantial market for domestic refrigerators for many years to come. Their resources will be used for much more necessary things.

### Overseas Market Conditions

Competition for what there is in the way of export business is likely to be very tough. Entry into substantial foreign markets is more likely to be directed to taking part in indigenous manufacture and competition rather than exportation to the market concerned. These tactics will also, of course, be followed by foreigners wishing to share in the British market. As economic integration between countries proceeds, manufacturers must increasingly regard the economic unit to which they belong as a unified market instead of differentiating between home and export markets. One may speculate endlessly about the prospects of trade between possible rival blocs.

Washing machine manufacture has a built-in brake on expansion. In the early days of market development fundamental design changes are so frequent and demand such heavy investment in capital, time and skill that a much more sober approach to the market prevails than is the case with refrigerators. As a result capacity is everywhere much more nearly related to the level of demand in all producing countries and it is not unlikely that overall there is too little capacity.

The export prospects for washing machines therefore seem much more rosy and when the immediate muddle in the home market is resolved, and the main basis of design is settled, manufacturers will be able to concentrate on production problems and lowered costs will provide them with strong cards to exploit the great opportunities in the export market.

In general, it seems probable that in the home market the next eighteen months to two years will see an intensifying competitive struggle, a crystallisation of the distribution structure, greater competition between retailers in a more stable market less subject to State intervention and one which exhibits a steady but lower rate of growth than was experienced in the '50's. The consumer will get increasing value for his money but at the expense of the range of choice and so long as he has the money he will continue to make greater and greater demands on the producers of electrical appliances.

Opportunities for profitable export will continue to grow for most products, but much will depend upon the exporter's ability to recognise a dead horse when he sees it and thus avoid the waste of energy involved in flogging it, as well as upon his ability to spot a good selling plater. Even more importantly both at home and abroad success depends upon his recognition of the importance of investing in information, detailed, continuous and comprehensive, as a condition of survival in an expanding market.

# VIEWS on the NEWS

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*By "REFLECTOR"*

THIS autumn, seemingly more than ever before, there is a flood of heating advertising. The coal, gas and oil interests are insistently pressing the merits of their particular services, but the electricity supply industry's claims are on a quieter note. There is a certain amount of advertising of off-peak heating, particularly floor warming, but the Electricity Boards are still a little afraid of the possible effects of too many fires and convectors coming on to the peak. Yet, without much encouragement, most electricity consumers buy and use electric heaters and the influence on the peak load of a few new arrivals would be minimal. I see that the Gas Council is offering central heating systems—hot water or hot air—under special terms. No deposit is required and five years is allowed for payment. The Coal Utilisation Council announces a new convector fire; this, too, can be paid for over five years. Electric convectors and fires do not enjoy this privilege. Coal, gas and oil are all claimed to be the best form of heating, but as my readers know they cannot really beat electricity for efficiency, cleanliness and convenience.

\* \* \*

Many types of fuel have been used in power stations, for instance, sugar cane waste (bagasse) and even coffee (in Brazil). Now *Power News* (published by the Central Electricity Generating Board) reports that tobacco leaf waste is delivered from a nearby snuff factory to Kearsley power station for steam raising. The waste, which is said to have "a calorific value of 3,000 B.Th.U.", is mixed with the normal fuel fed to the boilers. Can it be described as a fuel not to be sneezed at?

\* \* \*

William Willett, to whom the credit for our "daylight saving" system is due, is the subject of an article in the October number of *London Electricity*. The idea occurred to Willett in 1907 and in the following year he persuaded a friend, Robert Pearce, M.P., to introduce a Private Member's Bill "for the saving of daylight" into the House of Commons. The Bill received insufficient support and was rejected and it was not until 1916 that "summer time" was instituted, merely as a wartime measure; Willett did not live to see the triumph of his idea—he had died the previous year. Although this appreciation appears in an electricity supply magazine, I suppose it might be said that Willett was no friend of the supply industry: he deprived it of an hour's off-peak load every day for about half a year. He also caused the street-lighting staffs of electricity undertakings a bit of

trouble in the alteration of time switches twice a year. Mr. J. N. Hill, the writer of the article, recalls an instance when the lighting attendants were told one April to *advance* the solar switches an hour only to discover the following evening that someone had blundered.

\* \* \*

Edward Hyams, in the *New Statesman*, castigates the Electricity Boards for covering the country with overhead lines. He is particularly bitter about rural distribution systems which are liable to break down during thunderstorms. He says:—

"It seems to me that this sort of thing is hardly good enough in a countryside so urbanised and sophisticated as ours. The Electricity Boards and the Post Office are not providing a temporary service for which jury-rigged equipment thrown together anyhow will do. . . . Both seemliness and operating efficiency require that all these cables and wires be put away underground, like gas and water mains. They are properly part of the country's intestines, not its decoration."

There is much in this with which the Electricity Boards themselves will be in sympathy. Mr. Hyams admits that it would be expensive "to do the job properly," as he puts it. But it is just as sensible to suggest that all the railways (also "intestines" and not decoration) should be put underground.

\* \* \*

Interest in electrical matters is now so widespread that almost every publication has to deal with them in one way or another and electrical supplements are very frequent. Seventy years ago the *Electrical Review* rather resented the intrusion of non-electrical journals into its field, as witnesses the following note from the issue of 24th October, 1890:—

"A short time ago a monthly contemporary came out with a grand flourish of trumpets announcing that in consequence of the progress taking place in electrical applications, it would in future devote a portion of its valuable space to electrical matters. For a short time volts and ampères were thick in the air, while Mr. R. E. Crompton received polite attentions in the way of portraiture and otherwise. This was, however, too good to last. Whether it be that our contemporary has become frightened over electrical nomenclature, or whether it has exhausted its knowledge of the subject we, of course, do not know, but the peculiar fact remains that, while in one month's issue there was no electrical matter, a spasmodic attempt at revival in the current number has only resulted in a brief notice of Bristol's mining lamp, which is now a matter of ancient history."

# Electrical Appliance Approval

## BOARD'S PLANS ANNOUNCED

A decision to set up a British Electrical Approvals Board for Domestic Appliances was announced last December and sufficient progress has now been made for a more detailed statement of the Board's functions, method of operation and future plans to be given

SINCE the war the E.D.A./B.S.I. Advisory Committee on Electrical Appliances and Accessories and the activities of the E.D.A. Testing House have done much to remove shoddy electrical appliances from the market. There was still, however, the need to help the consumer to select safe and reliable appliances, which meant some means of identification. In November, 1959, as a result of a meeting at which the principal bodies concerned were represented, a Provisional Board was formed to set up an organisation "to protect and safeguard the British public by approving domestic electrical appliances and by maintaining and publishing a list of appliances so approved. Each such appliance will carry an easily recognisable mark of approval, and such approval will be based on British Standards and will be open to all domestic electrical appliances manufactured in or imported into the United Kingdom."

### Constitution of Council and Board

The organisation consists of a Council and a Board of Management. The function of the Council is to formulate broad policy and deal with public relations at the highest level. The Council consists of leading representatives of the electricity supply industry, the British Electrical and Allied Manufacturers' Association, the British Standards Institution, the Electrical Wholesalers' Federation, the Electrical Contractors' Association, the Home Office, the Electrical Association for Women, the National Chamber of Trade, the Consumer Advisory Council (B.S.I.), and the Women's Advisory Committee (B.S.I.). Lord Citrine has accepted the office of president of the Council. The Board of Management (still provisional until the Articles of Association have been approved by the Board of Trade) consists of the following members:—

*Chairman.*—Mr. T. E. Daniel.

*E.D.A. (For the Electricity Supply Industry).*—Messrs. D. B. Irving, R. R. B. Brown, E. H. Skinner, J. C. N. Baillie and J. I. Bernard. *B.E.A.M.A.*—Messrs. W. J. Bird, S. L. Pleasance, E. G. Plucknett, K. J. R. Cocke and T. Counter. *B.S.I.*—Messrs. H. A. R. Binney and G. Weston. *E.W.F.*—Mr. P. B. Etheridge. *E.C.A.*—Mr. L. C. Penwill. Mr. C. A. Zweigbergk was appointed director for the Board and took up his duties on 1st June, 1960.

Progress has been made towards providing the necessary executive organisation. In formulating the national approvals scheme, the greatest attention is being paid to the need to maintain independence and impartiality. By

directing its aim primarily towards protecting the consumer, the Board believes that it will at the same time benefit all manufacturers, wholesalers and retailers who are desirous of providing electrical goods of a high standard. Two important decisions may be singled out for mention. The first is that the criterion for approval is safety, not merely in the appliance as purchased but also after some years of use. Thus tests for approval on an appliance will not only assess the electrical and mechanical safety features but also reliability. The Board, however, reserves the right to withhold approval if the appliance manifestly does not operate as it is claimed to do. The second is that the standard of approval for all appliances shall be in accordance with British Standards and the B.S.I. has undertaken that all domestic electrical appliances will be covered by appropriate specifications concerned with safety.

The Board does not plan to set up its own laboratories. The principal testing house will be the E.D.A. Laboratories at Leatherhead, but, as may prove convenient, other laboratories of high standing, such as the B.S.I. Centre at Hemel Hempstead, will also be used. The Board's executive organisation will ensure uniformity of testing techniques and environmental conditions.

### Test Procedure

For any appliance submitted there will be an initial test of a sample (or samples) and the resulting test report will be considered by a Certification Committee representing the Board. If the Committee approves the sample, then the maker will be allowed to use the approvals mark (the design of which is now under preparation) on all appliances which conform with the sample tested. Check testing of samples of the same model will then follow at appropriate intervals, but at least once a year. There may also, where necessary, be visits to the producing factory to assess whether the environmental conditions and the quality control methods are satisfactory to ensure the maintenance of the standard of the sample approved.

There must obviously be a period during which domestic appliances already available and likely to remain on the market for some time, as well as immediate future models, must be considered for approval. Therefore machinery must be provided for controlling the rate of application during this period to avoid an excessive build-up of load which would inevitably cause delays. This is to be done by classifying appliances in groups which are most convenient for laboratory loading.

Applications for approval will be accepted and tests carried out on the samples according to a predetermined programme. The first group has now been chosen and a programme fixed. The appliances concerned are radiant fires, electric kettles, electric blankets and vacuum cleaners.

The necessary information, including details of the regulations governing the use of the approvals mark and also the system of fees for initial and check testing and the issuing of the licences to use the mark, and application forms, are being dispatched to all known manufacturers of the appliances in the first group. It is important that the agencies of overseas manufacturers of appliances in this group who wish to know more about the scheme, and any home manufacturers of appliances who have not received the information and forms, should write to the director of the British Electrical Approvals Board, 26/27, Cockspur Street, London, S.W.1.

Those manufacturers of the first group of appliances who intend to apply for approval should submit the completed forms to the director as soon as possible but not later than 30th November. Samples will then be called

for, tests carried out, and the notification of approval will be dispatched to each manufacturer simultaneously on 28th February, 1961.

Manufacturers of the first group of appliances whose applications for approval are not received until after 30th November cannot expect to be notified of the results at the same time as those who were able to comply with the programme. They will have to wait their turn.

In principle, it has been decided that any appliance appearing in the current E.D.A. list of approved appliances will be accepted in its turn in the group system, without further test. Electric blankets licensed to carry the B.S.I. "Kite-Mark" will be automatically eligible for acceptance without further test during the period of the first group. Any other domestic electrical appliance which carries the "Kite-Mark" will similarly be accepted in its turn in the group system.

The second group programme will be announced and started as soon as it can be handled. The period for submission of completed application forms for the second group of appliances will certainly overlap the first group programme.

## *Industrial Electrical Plant*

THE chairman's address to the Utilisation Section of the Institution of Electrical Engineers was given by Mr. J. M. Ferguson (English Electric Co., Ltd.) on 13th October. He began by saying that the standard of living of an industrial country was dependent upon two factors: first the wealth of the natural resources of the country, and secondly the productivity of the workers. Although this country led the world in the industrial revolution recent comparisons showed that the total output per worker in the United States was nearly double that in this country, and in the manufacturing industry the average output per worker in the United States was three times that in this country. In the basic metal industry, for example, the worker in the United States had at his command two or three times the power available in this country.

Power for industry was supplied in general by rotating machines of which there were three broad categories: (a) squirrel-cage induction motors; (b) wound-rotor induction motors, and synchronous salient-pole motors; (c) d.c. motors. The choice of an appropriate motor was determined by performance, first cost and running costs. The first cost was evidently affected by speed, rating and duty. Where relatively constant speed was required, first cost, running costs and general robustness all weighed heavily in the direction of squirrel-cage induction motors. Where the supply was limited for direct-on-line starting or where power-factor correction was called for, a synchronous wound-rotor machine might be used.

Variable speed was an essential requirement for a very large number of industrial drives, and by far the greatest proportion of these were still supplied by d.c. motors. Because of its lower cost, greater robustness and less need of maintenance, a great deal of effort had been directed towards making the a.c. squirrel-cage motor suitable for

variable-speed drives, although inherently it was a constant-speed motor for any given supply frequency.

New requirements for induction motors had fallen within previously accepted design limits and the rating for special duties such as boiler feed pumps had kept pace with the increasing size of turbo-generators. Considerable efforts had been directed towards achieving variable speed directly from a type of squirrel-cage induction motor. Pole changing had been developed as one solution to this problem and a similar result could be achieved with a type of induction motor having the stator wound with a composite coil, equally pitched and insulated, to give two windings of, say, 8 and 10 poles for two speeds. In large-horse-power wound-rotor motors there were control problems of starting, and cooling the rotor winding during this period was difficult. The technique of using hollow conductors, developed for large turbo-alternators, had been used to solve this problem.

Modern control schemes had increased the current changes in d.c. machines to high values, and this lag between current and flux adversely affected commutation. In some cases, it was practically impossible fully to compensate for this effect in the design of the control circuits. Laminated frames as well as laminated poles had therefore been introduced to meet these transient conditions.

Mr. Ferguson concluded his address by referring to automatic control gear and use of computers.

### **British Equipment for U.S Test Reactor**

Burst slug detection equipment has recently been delivered by Plessey Nucleonics, Ltd., to the Canadian Westinghouse Company for installation in the Westinghouse test reactor at Waltz Mill, Pennsylvania. The equipment will be incorporated in an experimental high-pressure gas loop.

## PRESENT-DAY EQUIPMENT REVIEWED



# Appliances for the Home

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ACCORDING to the recently published report of the Electricity Council for the year ended 31st March, 1960, the number of domestic consumers in England and Wales rose to 13,655,780, an increase of 2·2 per cent over the previous year. Sales of electricity to domestic consumers rose to a greater extent, by 7·9 per cent to 26,899 million kWh.

There can, of course, be no doubt that electricity, more than any other public service, has played a great part in raising the living standard of this country to its present level, and it is continuing to raise it. While we may not yet have reached the ideal, where every wired home is also an "all-electric" home, the housewife is fast realising the benefits obtainable from the possession of domestic electrical appliances. Indications are that cookers, refrigerators and washing machines are coming to be regarded as basic necessities.

In the following pages we endeavour to provide a picture of the multiplicity of services which electricity can perform in the home, at the same time indicating the trends of development and popular demand. Unfortunately, the majority of domestic appliances must still bear the inevitable burden of purchase tax and, where prices are mentioned, they are inclusive of purchase tax, if applicable. Apart from electric cookers, boiling rings, grillers, hot-plates and wash boilers, which are exempt, all domestic electrical appliances bear tax at the single rate of 25 per cent.

A list of the appliances available, with an indication of sources of supply, followed by the names and addresses of the respective manufacturers, will be found at the end of this article. As our readers will be aware, additional information regarding the more widely used domestic appliances is published at regular intervals in the *Electrical Review* in the form of detachable supplements.

## COOKING

LESS than fifteen years ago the number of electric cookers in use in this country numbered approximately a million and a half. It is estimated that there are now in use well over four million and the number continues to grow. The latest "saturation" figures show that, depending upon the locality, between 25 and

35 per cent of electricity consumers cook by electricity and it has also been calculated that the electric cooker industry is gaining ground on its gas counterpart at the rate of about 350,000 cookers a year. It is, in fact, a far cry from the early days of electric cooking in the 1920's. At that time people had not only to be convinced that electric

cookers were capable of cooking but also that they were not dangerous. Much progress has been made since then and improvement has followed improvement until today manufacturers can present to the housewife a cooker which not only cooks quickly, cleanly and efficiently, but also more cheaply than most other methods. For a family of four the approximate cost is no more than 4d per day.

Women rightly demand the highest standard from a cooker and there is evidence that this year a great deal more detailed attention has been paid to the design of the conventional electric cooker. Ovens are larger and most have reversible rod racks. Glass doors and interior oven lights are now also standard in many cookers. Three eye-level grill models are available, one of which is a medium-priced model with three hotplates, while another has a combined full-width eye-level grill and plate rack. Grills are provided in the oven in two models, and there are also two versions of split-level cookers. These horizontal models are particularly attractive and may be built into kitchens exactly where required. Both have four-plate hobs.

Grills are bigger this year and some models allow for nine different grilling positions, while new-style grids prevent fat from splashing upwards. More manufacturers are fitting the controls at eye level on the top of the splash-plate, but so far there does not appear to be a move towards general uniformity in this direction. Particular attention has, however, been paid to the age old problem of cleaning. On some models both hotplates and hobs are hinged, while the new type sealed-on hotplates require only a quick wipe over. Removable roofs and side panels also facilitate oven cleaning.

It is not generally considered that colour plays a significant part in the choice of cookers, but it is interesting to note that whereas cream was, until quite recently, the most popular choice, it now appears that the all-white cooker is gaining in popularity. An analysis of cooker sales carried out by the Modern Cooking Promotional Committee showed that the all-white cooker had taken over half of the market, cream had dropped to 40 per cent, while coloured cooker sales represented only 4 per cent. There appears to be no explanation for this preference for white cookers—possibly it is considered that white is the best choice as it will not clash with the many other colours now being introduced into modern kitchens.

The two new English Electric cookers that will be coming on to the



English Electric model 2033 cooker

market this autumn will be finished in white and cream, with the additional embellishment of satin anodised aluminium and chromium plate. They are plinth-type cookers, models 2032 and 2033, and they are designed to occupy the minimum of floor space and provide maximum cooking space. The extra-wide hotcupboard has a practical drop-down hinged door, the radiant hotplates have chromium plated steel trims, there is an inner glass door and an oven light, and the control knobs are placed at the top of the high splashplate. The outer door panels, hob and splashplate are finished in vitreous enamel and the outer casing and storage drawer, at the bottom of the cooker, are finished in synthetic enamel. Grey vitreous enamel is used for the interior of the grill chamber and oven. All the control knobs are of white plastic, with polished metal inserts, and the automatic timer on the de-luxe model is clearly marked with white figures on a black background. Both models are fitted with levelling screws.

To make the most of the oven space (loading 2,600 W) two non-tilt reversible grid shelves, resting in runner slots, give a total of nine different cooking positions. A safety feature of the hob is a raised lip on the front edge, which prevents saucepans overhanging—thus reducing danger to children. Two "Vee-line" radiant hotplates, one of 8in diameter (2,100 W) and the other 6½in diameter (1,250 W) are fitted. The 10½in by 8in grill boiling plate, with aluminium reflector, has a loading of 2,500 W. The price of the model 2032 is £45;

the "de-luxe" model 2033, which has an automatic oven timer and a shaded tubular light above the splashplate, costs £55 10s.

A logical development of the idea of placing the grill in the roof of the oven, which was pioneered in the original "Creda Mercury" cooker, is the "Rostaspit." This attachment, which heralds the return of true spit cooking, is now incorporated in the latest "Creda" cooker, the "Mercury Super Four." The "Rostaspit" is a complete and self-contained unit. It is designed to clip on to a meat pan and, when placed in the oven, automatically connects with a driving motor concealed at the back of the cooker. The motor is linked with the oven auto-timer control so that the heat is switched on and the spit starts operating simultaneously at any pre-selected time.

Another accessory now incorporated in the "Mercury Super Four" is a griddle. This is a large plate of polished cast aluminium constructed to fit firmly over the front two "Quick Disc" hotplates. So that the food to be cooked remains dry and is not fried, the griddle is surrounded by a channel which allows fat to run into a basting well at the front. A collapsible handle is provided to enable the housewife to lift the griddle from the cooker without the use of an oven cloth. Other features of the "Mercury Super Four" are a large size grill (six slices of toast at a time); automatic timer control; 5-hour ringer; inner glass door; oven interior light; separate heat-controlled warming drawer, etc. Four Creda "Quick Discs," each with a loading of 1,600 W, are fitted. The oven (2,500 W) and the grill (2,250 W) cannot be on together and the total loading of the cooker is therefore 9,300 W. The hob height is 33in, which is claimed to be the ideal, but a 3in plinth is available for those who may wish to match it with standard 36in-high kitchen units. The finish is in either cream or white and the price, complete with the new accessories, is 55 gns. A cheaper model, selling at 45 gns, is the "Mercury Super Three." This is fitted with only three "Quick Discs" but it incorporates many of the refinements of the larger cooker.

Cookers ranging in price from £28 to £56 are produced by the Electrical Division of Radiation, Ltd. The lowest priced cooker, the "Estate," is a development of the company's previous Jackson "Joy" model and it has been produced as a competitively priced 3-plate cooker for housing estates, bulk purchasing and similar markets. The standard model, 391P,

has two fast boiling "Speedring" plates (one 8in, 2,000 W, and one 6in, 1,350 W) controlled by six-heat switches, and a 10½ by 8in grill boiler (2,300 W). It has a large oven (3,000 cu in) with two 1,050 W side elements, and a plain plinth base. Model 391C has similar features, but a storage cupboard is provided in the base with a drop-down door which discloses a wire mesh tray for storing crockery, etc. This model is priced at £30 and the third "Estate" cooker, 391CT, which costs £5 more, has additionally an automatic timer and chromium plated bezels round the boiling plates and grill boiler. All models are finished in either cream or white vitreous enamel on the splashplate, hob and front, with stove enamelled side panels.

The higher priced Jackson "Highline" is also available in three different forms, the main functional components being common. These cookers are fitted with a large (12 by 8in) eye-level grill and the extra-deep grill pan can be used in nine different positions. The hob, one of the more important features of the "Highline" cookers, is recessed to retain any normal spillage, yet it is so shaped that ingress of spillage round the boiling plate openings is prevented. The "Speedring" plates fitted to these cookers are of standard Continental design and are 18 cm (7·1in) in diameter. They are held against the hob under tension, forming a seal with the hob pressings. The model 493 cooker has three "Speedrings," one of which is a very-high-speed (V.H.S.) plate with a loading of 2,400 W. The loading of the remaining two plates is 1,500 W each. All are controlled by

six-heat switches. An inner glass oven door is fitted and at the base of the cooker there is an independently heated hotcupboard. The price is £45 and a similar three-plate model fitted with automatic oven control, model 493T, costs £51. The four-plate "Highline" cooker, model 494T, priced at £56, has three "Speedrings" and one V.H.S. plate; automatic oven control; and an interior oven light. The finish of the "Highline" models is white with grey panels and yellow switch knobs or, alternatively, cream with grey panels and cream switch knobs. The normal height of these cookers is 32½in but, for those who prefer a higher cooker, a mobile plinth with castors and a brake is available.

A compact family-size cooker, complete with radiant plate, "Simmerstat" control and oven thermostat, is available from Tricity Cookers, Ltd., at £26 15s. This Tricity "Popular" is very compact, yet in no other sense is it a small cooker; the boiling plate and grill boiler are of the same dimensions as those fitted to the majority of full-sized cookers. There is a large



Simplex "Creda Mercury Super Four" cooker with the new "Rostaspit"

Other refinements include a large oven, inner glass door and interchangeable fascia panels in a choice of colours. The "Viscount" is wired ready to take an automatic time switch which can be purchased separately at a price of £5 5s. The Tricity "Marquis" (price £63) is this company's luxury cooker with four high-speed radiant plates, full-width grill, complete simmer control, glass oven door, oven light, automatic time switch and a 5-hour minute timer.

The latest G.E.C. cooker, the "Treasure," has an eye-level grill, glass inner door, a heated drawer and, on one model, an auto-timer for the oven. Two of its three hotplates are 7in "Superspeed" radiant types (2,100 W each) and the third is a 1 kW 5½in solid plate. The grill has a loading of 1,750 W and the oven 2,600 W. White or honeysuckle has been chosen for the finish of the cooker and the price (model D763) is £48. The auto-timer control model D765 is priced at £52. Other cookers in the G.E.C. range include the family size "Quality" (price £37 13s), designed for the smaller kitchen; the 2-plate "Splendid" (£44 15s); the "Superb" (£65), which is fitted with a gliding grill; and the luxury "Supreme" eye-level grill cooker. This last-named cooker is available as either a three-plate or four-plate model and its features include radiant plates with simmer control, a counterbalanced drop-down door, oven auto-timer and ringer timer. The prices are £74 (3-plate) and £79 (4-plate).

The Falco "Royalty" cooker made by Allied Ironfounders, Ltd., has convected oven heating. By circulating hot air round the oven an even tem-



G.E.C. "Treasure" cooker with eye-level grill

storage compartment for pots and pans and a selector switch, which controls the total loading, permits the cooker to be used directly from an existing 13 or 15 A socket outlet. The total loading of the cooker is 3,950 W or, with the selector switch, 2,950 W. Next in price range is the Tricity "Viscount" at £43 10s. Three 7in diameter radiant plates (2 kW each) are fitted as standard, and a full-width grill (2·2 kW) is fitted in the hotcupboard. Full adjustment of heat from slow simmer to fast boil on all plates and the grill is an additional feature of this cooker.



Jackson model 494T "Highline" electric cooker (Electrical Division of Radiation, Ltd.)



Falco "Royalty" four-plate cooker

perature is maintained from all directions. Styled on modern lines, it has an eye-level grill with full-width grill shelf, waist-level controls and automatic timing. The oven is claimed to be one of the largest of its kind and is fitted with an automatic interior light and a glass inner door. The hob carries four radiant boiling plates—two 8in (2,200 W each) and two 6½in (1,400 W each). In addition to white and cream, this cooker is also available in pastel blue. The price is £72 9s.

A Canadian company, General Steel Wares, Ltd., has set up a branch office in this country to sell Canadian-made electric cookers. Almost every de-luxe convenience that could be desired is incorporated in their new "McClary-Easy" range including "talking" dial

switches, an oven broiler, roasting spits and even a "meat minder," which signals when the roast is done. Radiant-type boiling plates are fitted to all four models in the range, which cost from £123 to £142.

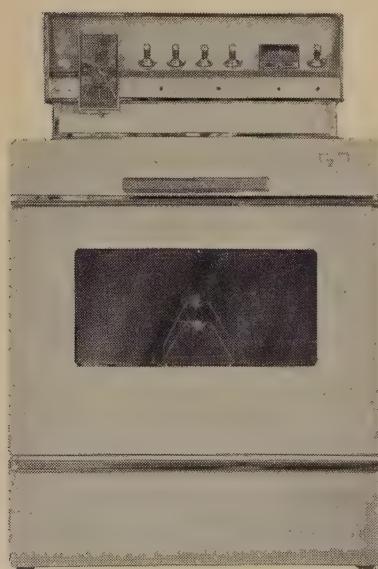
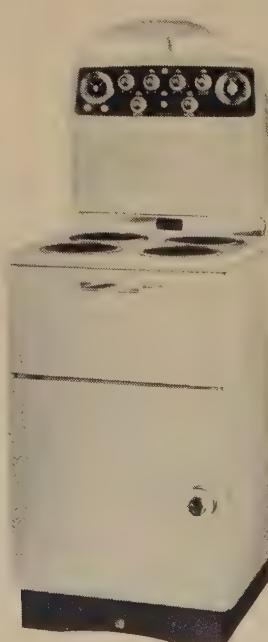
Canadian electric cookers are also obtainable from Moffats, Ltd. These range in price from £45 to over £200 each, and include many of the special features already known on cookers with such additions as surface elements, deep-well cookers, oven racks, thermoguards, roast-meters, barbecue units, etc. The company are also producing a built-in cooker with a choice of two or four radiant ring surface cooking hobs. A special feature of these hobs, or surface cooking units, is that only 3½in overall depth is required and they may thus be installed flush with the working surface with drawers underneath. The control panel is situated alongside the radiant elements on the hob working surface.

What is claimed to be a new advance in cooker design has been introduced by Belling & Co., Ltd. This cooker, the "Classic Sixty," embodies every modern cooker feature and there are no extras. It has four fast 7in radiant plates, as well as a large "double" grill on which twelve pieces of bread may be toasted at one time. The oven, also extra large, is lighted and controlled by an automatic timer. The cooker also has a choice of hob lighting, a 5-hour ringer timer, eye-level controls, an inner glass door and many other accessories. Wheels are built into the base of the cooker for easy moving and there is also a chromium plated bumper bar. The finish is

vitreous enamel throughout in white or two-tone cream, with a choice of hob colours. The interior is light grey and the price is £69 10s.

To meet the requirements of those housewives who prefer the oven as high as possible, the "Classic 70" cooker may commend itself. The oven has been raised so that it is just below waist level, making it very convenient to use and providing valuable working space above it. It has a similar specification to the "Classic Sixty" but with the addition of a large utensil drawer below the oven, which is situated to the left, and a heated food cupboard beneath the grill compartment, which is placed on the right. The overall height of this cooker is 54in and the height to the top of the hob is 36in. The hob itself measures 42in wide by 21in deep. It is priced at £105 and is also available with two ovens at £115. The Belling "Classic" cookers can also be arranged as two completely self-contained units. These units, consisting of the oven and the boiling/grilling section, can either be placed next to each other or used as part of a fitted kitchen with a dividing bench between them. They can, of course, also be used on opposite sides of the kitchen. Apart from larger cookers, the name of Belling has long been associated with the "Wee Baby" and "Baby" cookers. These models, designed for the small home or flat, are quite capable of dealing with roasts and bakes, as well as grills and toasts, and range in price from as little as £8 12s to £21 7s 6d for the "Big Baby," which can be operated from a 13 or 15 A socket outlet. Among the company's medium-priced cookers are the "47" type, of which they claim more are in use than any other electric cooker sold today. They have an oven roof that slides out for easier cleaning; an inner glass door; a loop in the oven roof on which a bird or joint can be hung for all-round roasting; a large hotcupboard and a handy utensil drawer; and rollers for easy manoeuvrability. The price of the model 47AB is £37 15s and the auto-timer version, model 47T, is priced at £45.

The largest cooker in the Revo Electric range is the "Revomatic." This has time-controlled boiling plates and a socket outlet in the control panel that can be time controlled too. Below the switch panel on the top of the splashplate is a concealed striplight to provide illumination on the hob. An extra-wide grill boiler measuring 8in by 18in is fitted on the hob and the remaining equipment comprises an 8in solid plate and an 8in radiant plate, all "Simmerstat" controlled. The

General Steel Wares model SDE 30-06  
"McClary-Easy" electric cooker

Belling "Classic-Sixty" cooker

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"Revomatic" is finished in porcelain enamel with a choice of cream or white for the body and black, grey or two-tone ivory for the hob. An unusual feature of the "Revo-Luxe" cooker is the toughened glass splashplate, with an eye-level control panel mounted above. This is supported on two pillars, which contain the wiring, and the splashback, being transparent, tends to give an appearance of airiness and also allows for kitchen wall decoration to be continued. The standard hob equipment of the "Revo-Luxe" is a 6½in and an 8in "Silver Seal" solid boiling plates (1,350 W and 2,000 W respectively) and a 10½in by 8in grill boiler (2,200 W). The Revo "Dandy" table cooker has been a popular item in the company's range of smaller cookers for many years. The loading is only 1,250 W and it weighs approximately 11½ lb. The price is under £5. The Revo "Peerless Major" can be supplied as a table model or on a leg stand or cabinet base. Standard hob equipment comprises a grill boiler operated by a three-heat switch and a boiling plate with "Simmerstat" control. It has a thermostatically controlled oven and a plate warming cupboard and is available in various colours. The price, with standard equipment, is £20 18s 6d.

Electric cooker boiling plates are a speciality of the Backer Electric Co., Ltd., and this year they have produced five new models, three of which are for hob-mounting and two which conform to the E.D.A. specification. The two E.D.A. types are 6½in and 8in, with loadings of 1,350 W and 2,150 W respectively. The hob-mounted models are 6in, 7in and 8in, with loadings of 1,350 W, 2,000 W and 2,150 W. All are fitted with vitreous enamelled reflectors. The use of this type of reflector is a revised feature brought in for technical advantages, as well as to make the cleaning of the boiling plate components easier for the housewife. The manufacturers claim that they do not lose their reflective property with continual cleaning.

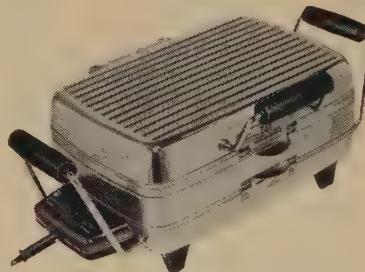
For those with limited space and time, the speedy infra-red cookers will probably be of interest. Magicook Appliances, Ltd., who claim to have made the first infra-red cooker, have a "Magicook de Luxe" on which steak can be cooked in a minute and bacon in twenty seconds. The total loading is 1,500 W and a temperature selector dial is fitted. The finish is chromium plate and the cooker is supplied complete with baking tins, grilling ring, drip tray and a useful cleaning brush. The price is £19 19s. Another quick cooking product from the same company is the "Magifry" "



Backer Electric Co.'s 7in single-circuit hob-mounted plate with vitreous enamel reflector



Magicook Appliances "Magicook" de-luxe infra-red cooker



Brattel "Tel" 5-way infra-red cooker

deep fat fryer, which measures 10½in high by approximately 11½in in diameter. The cooking oil capacity is 8 pints and a 150 W element is fitted. It is thermostatically controlled and the price, with a wire basket, is £16 10s 6d.

The "Cadi-Grill" rotary spit grill/roaster marketed by Standard Sales, Ltd., sells at only 13 gns. A 950 W infra-red element is fitted and a separate switch is provided for the roto-spit and the heating element. The top of the grill serves also as a hot-plate for warming plates and dishes and it is supplied complete with removable tray and a rotary spit with two forks. The grilling area is 11½in by 7½in and the total weight of the appliance is 9 lb. It is made of

polished aluminium. The company also market a larger de-luxe model (priced at £23 10s), the "Roto-Grill," which has a three-heat switch and a maximum loading of 1,200 W. It can also be obtained with a timer at an inclusive price of £25 4s. Among other "Cadillac" appliances distributed by this company is an electric coffee percolator that can be completely immersed for cleaning. The percolator is made of stainless steel and has a capacity of approximately 2 pints.

onor, Ltd., distributors of the German-made Siemens products, offer a varied range of cooking appliances, including standard sized cookers and table models. Among the table cookers both single and twin hotplate types are presented, as well as an attractive small cooker with the capacity of a normal sized model. Food mixers and an automatic toaster are also included in the Siemens range.

The "Tel" infra-red 5-way cooker by Remploy, Ltd., is of all-British manufacture. It is obtainable from the Brattel Electric Co., Ltd., and it combines infra-red grilling with the versatility of an electric cooker. With it one can grill, fry, toast, bake and boil in a remarkably short time. The cooking trays are removable and can be immersed in water for easy cleaning. The total loading is 1,750 W and the price is 21 gns. The "Moulinex" range of food mixers and food preparation machines, including coffee grinders, vegetable peelers, meat mincers, fruit squeezers, etc., are also distributed by this company.

A special feature of the "Palux Junior" rotisserie marketed by the Rustone Trading Co., Ltd., is that it has an open side. The food, when in position on the spit, rotates away from the direction of the opening and no outward spitting occurs. This "Junior" model is priced at £19 and a table model, with accessories, costs £39.

It is the claim of the Infra Heat Co., Ltd., that they can supply infra-red grills to suit all requirements, ranging in price from £8 10s to £42. All of their "V" grills are chromium plated, compact and attractive in design. Also from the Infra Heat Co. is the "Grillino," a non-rotating barbecue. It has an aluminium body 13in high by 8in diameter, containing a fireproof glass vessel in which food to be cooked is suspended on a metal frame and grilled from all sides at once. Between 17 and 20 minutes is said to be the time required to cook a chicken. Within the next few weeks the company hope to introduce the "Minigrill," which will have a consumption

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Range of S.N. Bridges  
"Luxury Life" automatic tabletop cooking appliances

of only 600 W, measure approximately 6in in diameter and weigh 7 lb. When open it can be used for frying, baking or boiling and, with the lid closed, steaks, sausages and even bacon and eggs can be grilled. In addition, sandwiches can be toasted and all types of foodstuffs can be steamed. The price is expected to be about £5.

The Sunbeam automatic table cooker is in the shape of a frying pan. In it chickens or a joint can be roasted or even a cake baked.

A British-made rotary spit, the "Rotisserie," is produced by Kenwood Manufacturing (Woking), Ltd. It is suitable for use either in the kitchen or dining room and the food to be cooked is rotated in penetrating heat at controlled speeds. Once the desired heat and cooking time have been reached, the cooker switches off automatically. The total loading of the appliance is 1,120 W and the maximum spit temperature at the centre with the glass door closed is 550°F. The complete appliance weighs 21 lb and it is priced at 25 gns.

A whole range of electric cooking appliances controlled by one unit is supplied by the National Pressure Cooker Co., Ltd. The range includes an electric pressure cooker, a cooker/fryer, an 11in frying pan and a griddle hotplate. Each appliance is operated by a "Controlmaster," a variable heat control unit that automatically maintains a selected temperature. It contains a thermostat, pilot light, etc., and may be used interchangeably to operate each of the appliances. An advantage of this method is that with the "Controlmaster" detached each appliance can be completely submerged when washed.

The new "Luxury Life" range of automatic table-top cooking appliances which have recently been placed on the market by S. N. Bridges & Co., Ltd., can similarly be used in conjunction with an interchangeable "Selectrol" thermostatic control unit. The range includes a skillet/cooker, a griddle/hotplate and a cooker/boiler. Both the skillet/cooker and the cooker/boiler have heat resistant glass

lids. All have embedded elements and the appliances can be completely immersed in water for cleaning purposes, including the element ends. The company have also introduced a new food mixer with attachments for shredding, mincing, whisking and blending, and a grinding bowl for coffee. The price, including the coffee mill and attachments, is £8 19s 6d.

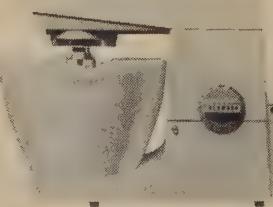
### Food Preparation

An Italian styled coffee mill, the "Piselli," is offered by Insley (London), Ltd. This recently introduced appliance is fitted with alloy blades rotating at 2,400 r.p.m. and in it enough coffee for 6 to 8 persons can be ground in 15 seconds. A transparent cover allows visual control



Presto rotary "Combinette" in use as a coffee grinder

Kenwood "Chef" food mixer



and rubber feet are fitted to protect table tops, etc. It is available in ivory, yellow or sky blue and the price is £3 15s.

The "Cadet" coffee grinder, one of the "Presto" range available from the National Pressure Cooker Co. (England), Ltd., is also fitted with a transparent lid and it can grind sufficient coffee for six cups within a few seconds. The colours are white, black or yellow, and the price is £3 2s 6d.

The "Mocalor" coffee grinder, of French manufacture, marketed by S. I. Engel & Co., operates only after the lid is tightly closed, thus making it impossible for coffee to be thrown out or for the user to touch its moving blades. In this machine about 2 oz of coffee can be ground in less than 20 seconds. The loading is 100 W and it is priced at £3 12s 6d. This company have also just introduced a chromium waffle iron, the "Wafflo," which is approximately 8in in diameter and has a loading of 700 W. The price is £4 19s 7d. The "Grill-Quick" infra-red grill, also obtainable from S. I. Engel, has a large grilling surface (10in by 7in), capable of accommodating three steaks. It is priced at 11 gns and the loading is 1,200 W.

The use of the electric food mixer in the kitchen saves much of the hard work involved in the preparation of meals, besides speeding the operation. Bylock Electric, Ltd., have recently added a dual purpose three-speed food mixer to their range of domestic appliances. The new model, complete with stand, bowl, twin dough hooks, twin beaters, whisk and turntable, costs £10 17s 8d. The 75 W motor, the manufacturers claim, is powerful enough to tackle really tough mixes.

The H.M.V. food mixer is of Swiss design and has accessories for mixing, blending, mincing, shredding and coffee grinding. The juice extractor is of special interest in that it separates the juice from the pith of the fruit and ejects them individually. This enables



Bylock food mixer

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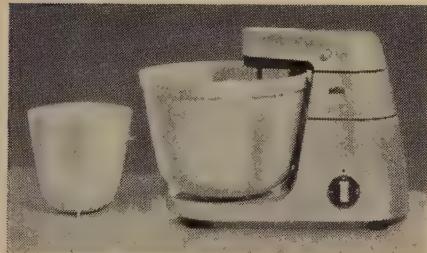
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the machine to be used for larger quantities and longer periods as it is not necessary to clean out after each filling. Anything from an egg to bread dough can be mixed with the same attachment. The machine is lightweight in construction and the unbreakable plastic casing is finished in blue and white.

One of the most popular models in the Kenwood range is the "Chef," for which nearly 20 attachments are available. This machine not only peels potatoes and vegetables, minces, grinds coffee, etc., but also slices beans and shells peas, and even opens cans.

The "Mixaway" food mixer, marketed by Metway Electrical Industries, Ltd., consists of a 120 W motor unit, stand, turntable, two beaters and two glass bowls. The variable speed control has fifteen positions and the motor unit is easily detachable for separate use. Ten extra attachments include a potato peeler and a juice extractor, a drill set, lambswool buffer and polishing brush.

The robust portable food mixer weighing just over 2 lb produced by Philips Electrical, Ltd., is provided with two stainless steel beaters, easily detachable for cleaning. The hand-grip of this model, which incorporates a press fingertip switch, and the motor housing, are dove grey and white plastic. The company also market a smaller "Whiskette" with a finish and outside casing similar to those of the mixer. The consumption is only 17 W and it can be used for mixing liquids of all kinds, including cocktails, milk shakes, etc., and for mayonnaise and sauces.



Berry's Electric "Magicmaid" food mixer

The introduction of the new "Junior Mixmaster" food mixer is announced by Sunbeam Electric, Ltd. This is specially designed for the smaller family and is supplied complete with stand, glass mixing bowl and a spatula. It has a three-speed 65 W motor and the mixer handle is marked for quick selection of the correct speed. The mixer, which weighs only 3 lb, can be removed from the stand and used as a hand machine. The price, including purchase tax, is £14 10s, and a set of

five attachments to work in conjunction with the new model is available for an extra £3.

The Sunbeam "Mixmaster" is a full-sized mixer which can be used either with its various attachments or as a portable machine. It has twelve speeds on its "Mixfinder" dial and these, combined with two specially designed beaters which fit the contours of the bowl—automatically revolving it—ensure even mixing at the correct speed.

The Crittall-Aquafont Group have just introduced an all-purpose kitchen machine, the "Kitchenmaster," that



Crittall-Aquafont "Kitchenmaster" all-purpose kitchen machine

has more than a dozen applications, including the peeling and chipping of potatoes, and "tenderising" steak. Fitted with a  $\frac{1}{2}$  h.p. motor, it is ideally suitable for the small kitchen as well as large households. The main unit is priced at £41 5s and extra attachments can be purchased.

Other companies that produce food mixers are Morphy-Richards, who include a light and easily handled mixer in their range of domestic appliances, and Berry's Electric, Ltd., who entered the food mixer field last year with the introduction of the Braun "Magic-maid" mixer. Two bowls are included in the standard equipment of this machine and the basic outfit comprises the machine itself, with a whisk and dough hook, grater unit, mixer attachment, spatula and protective cover. Drinks can be made quite simply in a large glass goblet, which is part of the mixing attachment, and there is also a separate grinder. Despite its lightweight plastic casing, the "Magic-maid" is stable in use. It is controlled by a three-speed rotary switch placed conveniently on the side.

The Continental Peugeot "Squirrel" food mixer, at £5 2s 6d, is a hand operated electric mixer marketed by Rudson, Wood & Co., Ltd. It has two sets of beaters for heavy and light mixtures and a two-position switch for continuous and intermittent beating. The company also handle the Peugeot "Rubis" coffee grinder, which

costs £2 17s 6d. This compact appliance is attractively finished in white enamel with a transparent plastic top and is simply operated by means of a press-button switch.

Many homes which are without an electric cooker nevertheless have an electric kettle. Several domestic appliance makers are engaged in their manufacture and one of the largest is Bulpitt & Sons, Ltd. Recently they have introduced higher loadings as additions to their "Royal" and "Siren" series. The "Royal" 3 pint kettle is available in 2 kW and 2.3 kW loadings, while the "Siren" (a whistling kettle) and "Swift" kettles are produced with a standard loading of 2 kW and an extra high loading of 2.5 kW.

A.E.I.-Hotpoint, Ltd., now produce a 2.6 kW 3-pint kettle which is claimed to boil 1 pint of water within 94 seconds. This new "Hi-Speed" kettle is an addition to the company's existing range which includes kettles in 2.3 kW, 1.5 kW and 1 kW loadings. It has a slightly deeper body than the existing 2.3 kW model and also a restyled lid with a deeper flange. The price is £4 18s 6d, the same as for the 2.3 kW "Hi-Speed" kettle. Other fast boiling kettles are the G.E.C. "Superspeed" models. These are normally fitted with 2 kW elements and are in 3 and 5 pint sizes.

A vapour-controlled model, the K.2, is obtainable from Russell Hobbs. This kettle, which has a capacity of 3½ pints, is claimed to be the only really automatic electric kettle. When the water boils the vapour passes through a duct to a thermostat in the handle, which switches off the current



A.E.I.-Hotpoint "Hi-Speed" 2.6 kW 3-pint kettle

and an indicator lever snaps out. To re-boil it is only necessary to depress the lever.

Apart from their utility value, electric coffee percolators can be attractive items of domestic equipment and their use is not necessarily confined to the kitchen. Many people prefer to make their coffee in the dining room or lounge and the percolator, when not in use, graces the table or sideboard. In the Bulpitt "Swan Brand" range there are four models, the latest being

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the "Winchester," an automatic percolator with a capacity of 2 pints. It is made of chromium plated aluminium and the loading is 450 W.

The G.E.C. D.5373 model makes  $1\frac{1}{2}$  pints of coffee at a time and the loading is 400 W. The finish is chromium plate on copper and it has a drip-free spout. The price is £8 1s 6d.

Another company now producing coffee percolators are N. C. Joseph, Ltd. Their new "Sona" has a capacity of  $2\frac{3}{4}$  pints (10 cups) and with it coffee can be made in 12 to 14 minutes. It is fitted with a 600 W element, which ensures fast and even heat distribution, and percolation is said to commence within 45 seconds of its being switched on. This percolator is constructed of aluminium and the exterior is chromium plated. It is approximately 12in high and the price is £5 12s 6d.

There are also glass models on the market, such as those made by S.L.R. Electric, Ltd., and the Cona Coffee Machine Co., Ltd. The last-named company have, after a period of fifty years, replaced their traditional "De Luxe" table model with a "New" table model, which incorporates several functional improvements. It is produced in four sizes,  $\frac{1}{2}$ , 1,  $1\frac{1}{2}$  and 2 pints, for both spirit and electrical operation. The electric models now have a tubular 350 W element in place of the previous spiral type and the bowl and bowl handle have been made detachable from the stand to provide for easier pouring. The prices of the "New" percolators range from £7 3s 8d to £8 8s 4d.

An automatic electric coffee pot with a combination set of cups, saucers, cream jug and sugar basin, is now available from Russell Hobbs in eight different designs, the latest addition being "Thrift." The body of the coffee pot is made of porcelain and the makers claim that this maintains the coffee in perfect condition to the



Metway electric toaster



Russell Hobbs electric coffee pot

very last cup. The company also produce an automatic tea maker, also in ceramic and similarly accompanied by matching accessories. Like the coffee pot, it can be controlled by a switch alarm unit—a synchronous clock which serves both as a switch and timepiece. Any combination of appliances within its loading capacity can be plugged into the unit's two 5 A sockets.

There are perhaps a dozen or so different makes of electric toasters on the market, the majority of which are non-automatic in operation. Little change has taken place with regard to this particular appliance during the past twelve months and few new models have become available. An exception, however, is the Metway "Toastaway" toaster, which caters for a market between the standard toaster and the "pop-up" type. Four pieces of bread can be toasted at a time and they can be turned over in one movement by depressing finger-grip knobs located in the toaster end pieces. The toaster has a clockwork timer which can be set to any period up to 60 seconds, after which it automatically switches off. It is sturdily constructed of polished stainless steel with black moulded ends and base and it is suitable for use on either a.c. or d.c. The loading is 700 W and the price is £4 14s 2d.

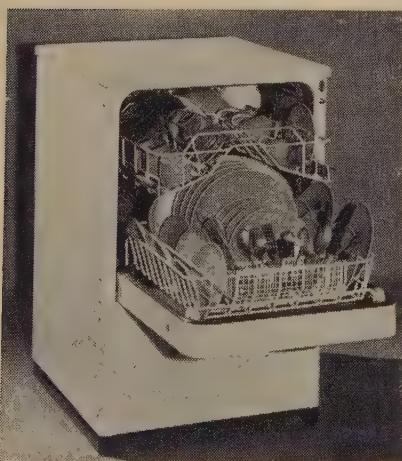
With the Morphy-Richards automatic toaster variations either in individual tastes or in toasting times for different types of bread are made possible by a "browning" control selector. This toaster, one of the few domestic "pop-up" types still on the market, has been a popular selling model for many years.

In addition to cooking and preparing food for the table, it is also essential to serve it hot. In the two new G.E.C. warming plates a heat distribution that varies by only  $1^{\circ}\text{F}$  over the whole surface is achieved by a printed heating circuit which is spread on the underside of the  $\frac{1}{4}$  in thick toughened glass. The glass is mounted in two chromium plated brass side channels with moulded end pieces. When switched on the warming plate reaches a temperature of  $200^{\circ}\text{F}$ , at which it stabilises—a red lamp indicates that it is working correctly. The plates are made in two sizes, 18in with a loading of 200 W and 30in, loading 350 W. Both are 9in wide and the respective prices are £6 19s 6d and 12 gns.

The English Electric plate-warmer costs 12 gns and is made of two sheets of toughened glass with the heating element bonded to the underside of the top plate. The whole is supported in a chromium plated frame shaped with handles so that it may be carried like a tray. It measures approximately 30in by 15in and the loading is 400 W.

The Berry's Electric plate-warmers are in two sizes: 18in by 9in (200 W) priced at £6 19s 6d, and 30in by 9in (350 W) priced at 12 gns. They are designed so that they can be used on polished surfaces.

An appliance about which little is heard but is, nevertheless, a most useful product, is the electric jug. Bulpitt & Sons include one among their "Swan Brand" products and it has several uses. Apart from heating milk and soups, it is useful for cooking vegetables, tinned or frozen foods, boiling water or for making tea or instant coffee. The inside of the jug is marked in  $\frac{1}{4}$  pints and the total



Bulpitt "Swanmaid" dish washer



G.E.C. plate-warmer

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capacity is  $1\frac{1}{2}$  pints. It has a pilot light indicator and five clearly marked thermostat settings which give a range of controlled temperatures. The body is of polished aluminium with plastic handle and fittings in black or cherry red. The loading is 600 W and the price £5 10s.

One of the first domestic electrical appliances to be manufactured by Charles Colston, Ltd., was a dish-washing machine. It measures only 24in high by 21in wide by 17in deep, and is thus small enough to be accommodated on a draining board. It is a completely portable appliance and no plumbing is necessary. Water is supplied through a rubber hose connected to the kitchen tap. It can deal with up to 24 plates and saucers and 12 cups or glasses, cutlery, etc., in one load and is fully automatic in operation. Loading is from the front, by means of a drop-down door, and should this door be inadvertently opened while the machine is operating, a safety device switches off. The 3 kW heater is also switched off should there be an insufficient supply of water. The running costs are claimed to be very low, only 1 gallon of water being used during each operation and the action of a jet accelerator is said to produce the effect of water at the rate of 60 gal/min.

Another company which produce a dish-washing machine are Bulpitt & Sons, Ltd. Their "Swanmaid" dish washer is also designed for front loading, it being necessary only to slide its plastic-covered trays forward when they can be easily stacked without the possibility of damage to fragile china or glass. It is a fully automatic machine and once the operating button is pressed and the door closed, nothing more has to be done by the user. A 3 kW thermostatically controlled heater raises the temperature of the water to  $180^{\circ}\text{F}$  and the machine then switches into a timed cycle—one hot cleansing wash and two hot water rinses. This cleaning cycle is completed in about fifteen minutes, after which the dishes can be left in the machine to dry off.

The Kenwood "Dishmaster" dish washer is available in several versions—a standard model, a pump model, a heater model and one with a self-opening lid. The fully-automatic model, A.470, requires approximately 3 gal of water for each complete dish-washing cycle. The water is obtained from the normal domestic hot water supply via a built-in 3 gal  $2\frac{1}{2}$  kW thermostatically controlled booster tank. Only 2 gal of water for each complete dish-washing cycle is required for the "Dishmaster" heater

model A.440 and the operation is semi-automatic. The standard model, A.430, does not incorporate a 3 gal heater tank and it can, therefore, be used from a 5 A socket outlet. All the "Dishmasters" are available in white or cream and they range in price from £117 12s to £99 10s.

Of particular interest to flat dwellers is the Kenwood "Wastemaster" refuse disposer which hygienically and automatically disposes of kitchen waste through the sink outlet and, after shredding it to small pieces, flushes it down the drain.

The waste disposal unit introduced by the Haigh Engineering Co., Ltd., has a built-in acoustic hood to deaden noise. This machine, the "Tweeny de-Luxe," also has, as an optional extra, an automatic controller which provides a speedy cut-out should the machine be misused. The controller also reverses the direction of the

impeller after each operation to double the life of the cutter ring. It is priced at £48 4s 8d.

The "In-Sink-Erator" units marketed by the Borg-Warner Corporation of America are now distributed in this country by the Wymbourne Electrical Co., Ltd. Two models are available, standard (333) and de-luxe (77), and both are fitted with capacitor start  $\frac{1}{2}$  h.p. motors. For ease of installation the mounting rings are connected by set screws and the housing swivels full circle to align with the waste trap. The additional features of the de-luxe model are that the motor and shredder reverses each time when switched on and also when the shredding load is extra heavy, thus preventing jamming. Both models are finished in white enamel and the sink fittings and cover are of stainless steel. The prices are £41 9s 6d and £49 7s respectively.

## REFRIGERATION

LAST year's exceptionally fine summer, combined with the withdrawal of hire-purchase restrictions, produced a remarkable increase in sales of domestic refrigerators in this country. According to information issued on behalf of the Domestic Refrigeration Development Committee, a record total of nearly 850,000 was sold in 1959. This strong upward surge in sales has not been maintained. But despite a disappointing summer from the refrigerator manufacturers' point of view and the partial reimposition of hire-purchase controls, the total sales during 1960 are expected to be not very much below those achieved last year. This does not necessarily indicate that refrigerators are any less desired and, in fact, a refrigerator, formerly considered a luxury, is now increasingly being regarded as an

essential part of modern living. The number of manufacturers and distributors has grown considerably over the past few years and there are now more new firms, and new models, than at any other time. Many of the refrigerators which are offered for sale are imported models, chiefly from the Continent, but there are also several British manufacturers who have entered the refrigerator market for the first time.

Probably the most outstanding feature in the design of the 1960 refrigerators is their sleek streamlined exteriors combined with the skilful arrangement of the interior fittings to make full use of every inch of storage space. Another feature is the adaptability of the new models. Many of the popular small- and medium-sized refrigerators can be installed either in a free-standing position or built under existing work surfaces. Several others are designed to be placed at eye-level in line with kitchen units. Doors have been designed to open within the width of the cabinet so that if kitchen space is limited the refrigerator can be sited close up to other kitchen fittings.

The table-top refrigerators, in the medium size range, continue to be the models most in demand. Typical of a manufacturer that offers this type is the Simplex Electric Co., Ltd., a company that entered the refrigerator field earlier this year. Their two latest models, the "Creda 300" and the "Creda 475," are typical of the new trend, having doors which open within their own width. The door handles

Simplex "Creda 475" 4.75 cu ft refrigerator





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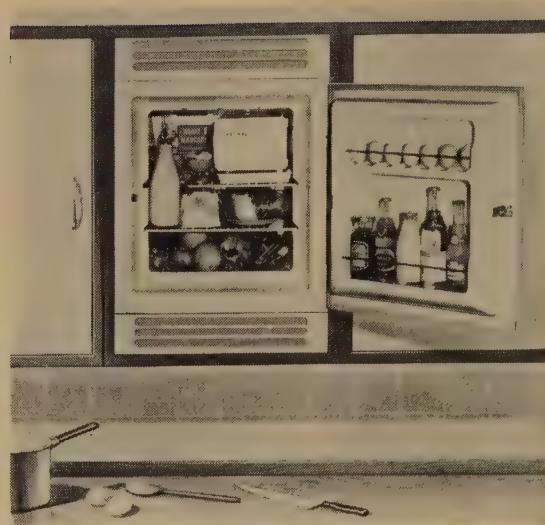
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are recessed and the thermostatic controls are mounted on raised back sections, permitting easy adjustment of the temperature setting without the need to grope inside the refrigerators. The respective capacities of these models are 3 cu ft and 4.75 cu ft and the internal layouts of both have been arranged to provide for the greatest convenience in use, combined with maximum storage space. The insides of door panels are generously apportioned for items in constant use; there are large egg racks and dairy compartments and unusually high bottle spaces. The larger model has a "crisper" drawer and an interior light. The outer cabinets are finished in either white or cream and a pale coffee coloured moulding is used for the interior liners. Both are table-top models and they are priced at 52 gns and 66 gns respectively, including purchase tax.

Morphy-Richards (Astral), Ltd., produce the "Astral" absorption-type refrigerators. Models include a 2 cu ft table-top refrigerator suitable for the smaller household, the 2.3 cu ft "Console" and the 4 cu ft "Commodore." The largest model contains over 8 sq ft of shelving and has a cold compartment combining three ice trays and space for frozen foods. Now, to meet the growing demand for a built-in refrigerator, Morphy-Richards have introduced to the British market their A.160 model. This has a storage capacity of 1.6 cu ft and sells at £35 10s. The door interior incorporates a bottle shelf and an egg rack and two ice trays are provided in the cooling unit. Alternatively, this unit can store up to 4 lb of frozen foods. The refrigerator measures approximately 31in high by 21in wide and the depth, including the handle, is 23in. The exterior is finished in either white or cream stoved enamel, while the interior is of light blue polystyrene.

Earlier this year Pakamac (Special Products), Ltd., introduced a 4 cu ft absorption-type table-top refrigerator, the "Pakamatic 350." It is fitted with a removable egg rack, bottom glass shelf and a seven-position thermostat. A recent announcement from the company states that they will be introducing a new model, to be known as the "Pakamatic 250," at the beginning of next year. This will be of 2.5 cu ft capacity and will possess many of the features of the larger model.

A newcomer to the Electrolux range of absorption-type refrigerators is the Electrolux "Sixteen." Styled especially for the smaller kitchen, the "Sixteen" can be put on a cabinet, hung on a wall or mounted on a stand. Compactly planned, it has 3½ sq ft of shelf



Morphy-Richards "Astral" built-in refrigerator

Pakamac "Pakamatic 350" refrigerator

area and a capacity of 1½ cu ft. Two removable door shelves are provided and the ice compartment, which normally holds an ice tray to provide 44 pieces of ice, is also large enough to accommodate a frozen food packet. The refrigerator, which measures 21½in high by 19½in wide by 21in deep and weighs only 54 lb, is finished in white high gloss enamel. There is another version of the same refrigerator, which can be built into kitchen units, and both are priced at 31 gns. Other models in the Electrolux range include a 2.7 cu ft refrigerator, the L.27, and a 5 cu ft luxury model, the L.50. A useful addition to the company's popular L.26 model is a new "two-way" shelf which provides storage space for tall bottles, while a new feature of the L.37 is the provision of two slim ice trays, each providing nine cubes. The largest refrigerator available from Electrolux is the L.76, a 7.6 cu ft luxury model with 14½ sq ft of shelf area. It has an interior light, two vegetable drawers and a set of food containers.

A.E.I.-Hotpoint, Ltd., state that sales of their "Iced Diamond" range are going so well that the same models will be kept in 1961, but a new interior colour scheme will be added. The models with the new colour scheme will be known as the "Iced Diamond" F.37 and F.50. The "Iced Diamond" refrigerators were designed with close consideration to adaptability so that they can be used free-standing or built into a kitchen unit and they can both be obtained with either right- or left-hand door opening. Doors open within the width of the refrigerator so that it can stand flush against neighbouring units. The F.37 occupies only 21in square of floor space and the F.50 24in square—the same as the current range. Both will be available in white or cream stoved enamel finish with coloured vitreous enamel



table tops. The rollers, introduced for easy movement, are also retained, as is the automatic interior light. The price of the F.37 is 57 gns (table top 3 gns extra) and the F.50, complete with table top, is 70 gns.

With the introduction of the "Leisure" 5½ cu ft refrigerator Allied Ironfounders is one of the latest companies to enter the refrigerator market. The new model is a compressor type and has a shelf area of approximately 11 sq ft. It has a full-width freezer compartment with accommodation for up to twenty packets of frozen food, and a salad crisper. Extra storage space is provided in the door interior and other features include a large chill tray, automatic interior light and a door lock. The finish is in white enamel with an interior in two-tone colours with gold trim. The price is £78 15s.

Bendix Home Appliances, a name long associated with home laundry appliances, now market a comprehensive range of luxury refrigerators. The range consists of four free-standing models with capacities of 4.5, 6, 7 and 10 cu ft and a 4 cu ft table-top model. The prices range from £59 15s to £125. Features common to all models are door-operated interior lighting, thermostatic temperature control, adjustable alloy shelves which are

easy to clean and non-corrosive, an extra-large glass covered crisper, non-slam door latch and door compartments. The finish of all models is in either white or cream stoved enamel and the table-top model has a champagne and coral plastic interior.

The four models in the English Electric "Slimline" range have been specially designed to take up the minimum of floor space. The smallest, the 2.7 cu ft "Junior," incorporates an unusual feature—a magnetic strip round the door to give a perfect seal without the need for a latch. This model costs £50 8s, and a matching plinth can be bought as an optional extra to bring the refrigerator up to the normal 36in working height. The 4 cu ft "Popular" is a table top model (price £60 3s 3d), while the 7.7 cu ft "Senior" costs £109. The largest refrigerator is the 9.4 cu ft "Elite," a de-luxe model, costing £125. All four refrigerators are finished in white (the "Popular" in cream too) with an

The G.E.C. offer refrigerators to suit all tastes and purses. Their largest, the DE.82, is an 8 cu ft luxury model 55 $\frac{1}{4}$ in high by 28in wide. There is also the DE.61, a 6 cu ft model, 51in high by 25 $\frac{3}{4}$ in wide. Each is provided with a full-width stainless steel freezer and a deep chamber for meat and fish. The prices of these models are £125 and £99 respectively. One of the G.E.C.'s more popular models is the "Fabulous Four," a table-top refrigerator designed on modern lines. This is fitted with the company's patented "Slide-o-matic" hinge which allows the door to open within the width of the cabinet. For the lower price market the G.E.C. offer a small absorption refrigerator with a loading of about 100 W. Although it has only 2 $\frac{1}{2}$  cu ft capacity, the ingenious design of the interior provides over 5 $\frac{1}{2}$  sq ft of shelf area, and racks in the door enable tins, bottles and eggs to be stored with ease. This model, which is under 33in high, is priced at £48 7s 6d. Looking to the future, the G.E.C. are working to develop what is known as a thermo-electric cold box. Operating on the principle of the Peltier effect (the production of cold at one side of a thermocouple and heat at the other when direct current passes through it). The idea has now been developed to a practical stage. The system offers the advantages of lightness, no moving or wearing parts, silent operation and,

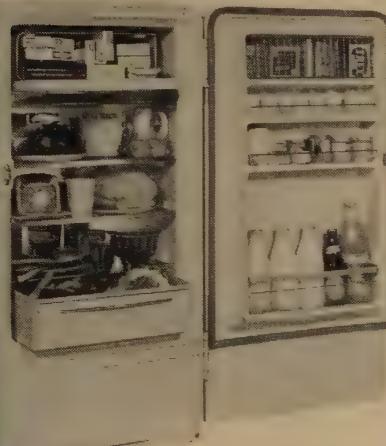
compartment. It can be obtained with either a white or cream cabinet with red trim on the door and the interior and fittings are finished in light blue.

A similar refrigerator still in great demand is the Jackson "202," a product of the Electrical Division of Radiation, Ltd. This small family sized refrigerator has a 2 cu ft capacity and is one of the few that has an all-plastic cabinet. It will fit in any kitchen and is designed to stand on the floor, table or bench. A table top and legs are available to bring the refrigerator up to table-top height or, if so desired, it can be mounted on the wall.

The Pressed Steel Co., Ltd., manufacturers of the "Prestcold" range of refrigerators, are starting production of a new range of refrigerators but details of these are not yet available.

Production is anticipated within the next month or two of a new 4.6 cu ft refrigerator by A. J. Flatley, Ltd. This, the manufacturers claim, will combine all the features of the more expensive luxury models at a cost of only 39 gns. The dimensions are 36in high by 22 $\frac{1}{4}$ in wide by 25 $\frac{1}{4}$ in deep and the finish is in white or cream stoved enamel, with a "Warerite" working top in a choice of colours. An interior light is provided and door storage space for bottles, dairy produce and eggs. It will be guaranteed for twelve months with a five-year guarantee on the "Sternette" sealed compressor unit.

A refrigerator which has a vertical sliding door is among the many kitchen appliances manufactured by English Rose Kitchens, Ltd. It is known as the "Double Six" refrigerator and



Falco "Leisure" refrigerator  
(Allied Ironfounders, Ltd.)

internal colour scheme of alpine lilac and clover ice.

The latest model to be introduced by Lec Refrigeration, Ltd., is the "Twelve/Six" dual temperature refrigerator/freezer. The top section has a capacity of 12 cu ft of normal refrigeration space with four adjustable sliding shelves. The door is fitted with adjustable aluminium racks, a butter and cheese compartment and storage space for quart size bottles. The deep freezer has a lower compartment with a capacity of 6 cu ft, giving long-term storage space for over 200 lb of frozen foods. Both sections are fitted with plastic white interiors and the exterior is also white with a blue panel and chromium handles. The price of £179 10s includes a service fee of £10.



Lec Refrigeration "Twelve-Six" dual temperature refrigerator/freezer

furthermore, the design is such that it can be operated directly from a car battery.

The "Main 24" refrigerator introduced by R. & A. Main, Ltd., is similar in many respects to its predecessor, the "Main 22." It is an absorption model (capacity 2.4 cu ft) and the cabinet, which has a flat top, measures 36in high by 21in square. Full use is made of the inside door area for storage space and up to 2 $\frac{1}{2}$  lb of frozen food can be stored in the ice

Electrolux "Sixteen" 1 $\frac{1}{2}$  cu ft refrigerator



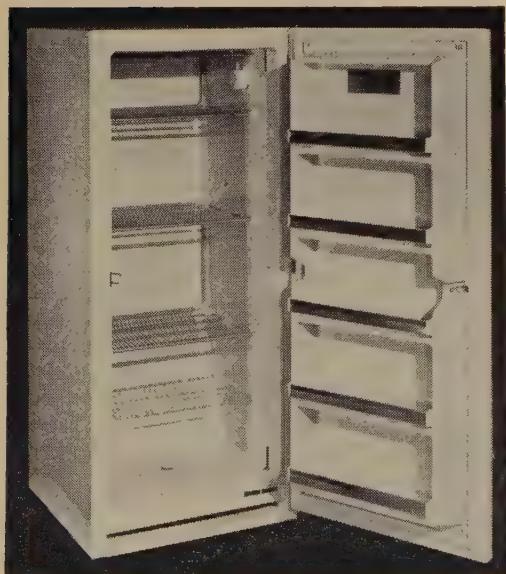
has 6 cu ft of refrigerated space with 6 cu ft of storage space in a cupboard below. By keeping the most frequently used foods on the upper shelves, the need to open the door fully is eliminated and minimum contact with the outer air is achieved. Pull-out shelves give easy access to foodstuffs, even at the rear of the cabinet, and also make for simplicity in cleaning. It is obtainable in a choice of seven attractive stove enamelled colours with a white sliding door. It measures 66in high by 30in wide by 24in deep.

The new "Leatline" 3.6 cu ft absorption refrigerator is styled in the latest square shape, with working table top, to standard kitchen unit dimensions, 36in high by 21in square. It has a full-width freezer, adjustable shelves and door storage space, and the price is 49 gns. The manufacturers, F. & T. Leat, Ltd., state that later this month the "Leatline" will be avail-



F. & T. Leat, Ltd., "Leatline" 3.6 cu ft refrigerator

Kelvinator model KVJ-10 domestic home freezer



Lightfoot model LT.13-5 4.7 cu ft refrigerator



Flatley 4.6 cu ft refrigerator

able with a compressor unit as an alternative at a price of 55 gns.

For those who prefer the large sized refrigerators, Kenwood offer the "Kenwood Norge" range. These de-luxe refrigerators, 14.6 cu ft, 13.3 cu ft and 12 cu ft, have automatic defrost refrigerator compartments and what is known as the "Customatic" cold system, which maintains the correct temperature for the preservation of all foods. The company also offer two smaller types with capacities of 4.1 and 5.6 cu ft respectively.

Increased capacity, larger and colder frozen food compartments, more shelf space and re-styled exteriors are some of the features of the refrigerators available from the Frigidaire Division of General Motors, Ltd. They range in size from the 3.4 cu ft table-top model to the 10.1 cu ft de-luxe model. All are fitted with the "Meter-miser" rotary compressor and they are sold in a choice of five exterior colours.

The success of the extra low-temperature freezer chest fitted to all Kelvinator refrigerators (except model K.46MT) has resulted in the company deciding to extend this feature to all models for the 1961 season. Capable of maintaining temperatures between zero and 5°F with the thermostat set on normal, the "Zero-Plus" freezer provides safe storage for both frozen food and ice cream for periods of one to two months. Because of this new improvement to the range, models K.46MT and K.46MTC have been discontinued and models K.60, K.77, K.9.4 and K.9.4MD, incorporating the freezer chest, will be available throughout next year. Model K.46MT will be replaced by a cabinet of the same size and design but incorporating this feature. Kelvinator also produce a domestic home freezer, Model KVJ-10. It has a capacity of 10 cu ft and special features include three fast-freezing shelves and a refrigerated top plate.

The "Wallis" absorption 2½ cu ft refrigerator, produced by the Dorset Refrigeration Co., Ltd., is manufactured mainly for export. It is, how-



Jackson "202" 2 cu ft refrigerator  
(Electrical Division of Radiation, Ltd.)

ever, understood that the company has recently started looking into the home market. It is a sturdily built refrigerator and the cabinet is normally finished in white but other colours can be supplied.

No changes are announced in the Lightfoot Refrigeration Co.'s range, which includes 4.7, 6.4 and 9.2 cu ft models. These refrigerators, which are specially made in Western Germany for Lightfoot, incorporate the majority of the refinements to be found in refrigerators nowadays, including interior lights, plate glass shelves, bottle racks, etc.

The table-top refrigerator, model 13T, now being marketed by Bylock Electric, Ltd., can be used as a built-in or as a free-standing model. It has an extra-large table top which extends back to the wall, offering a specially big working surface. The door handle of this model is of particular interest. The design is such that it fits well into the hand but should one's hands be full the door can be comfortably opened with the wrist or elbow.

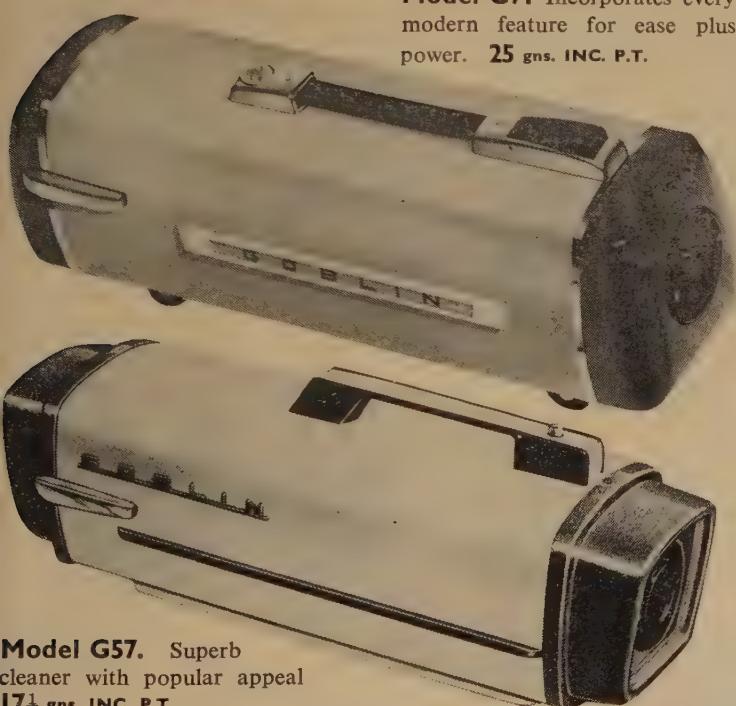
Special features of the Baldwin "Atlantic" refrigerators distributed by the domestic appliance division of H. J. Baldwin & Co., Ltd., are large freezing compartments, full-width crispers,

# The range with appeal! —that's why everyone's a **GOBLIN** customer

The w-i-d-e Goblin range has something to appeal to everyone at prices that couldn't be more attractive.

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**De Luxe Model D25.** Automatic bedside tea or processed coffee maker. £19.5.0 INC. P.T. (excludes crockery)

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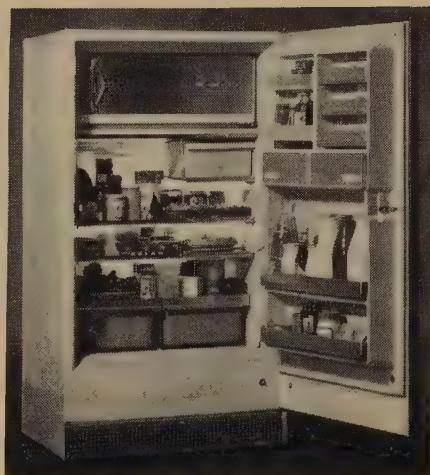
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Forget credit restrictions—utilize to the full Goblin's neat Cleaner Trade-in Plan. You trade-in any model as part payment on a new Goblin—we issue appropriate credit note in accordance with allowance scale.





Harper 2½ cu ft refrigerator

General Steel Wares model ZD.11-06  
"McClary-Easy" refrigerator

interior lights, and lockable door handles. They range in size from 4·1 to 7·4 cu ft and their one-piece steel cabinets are finished in white stoved enamel with vitreous enamelled white interiors and blue plastic door trims.

A refrigerator which can serve also as an item of furniture is produced by Coldette Refrigeration. This model, known as the "Cadet," is attractively finished in an oak cabinet with an easy-to-clean stove enamelled interior. The approximate capacity is 3 cu ft and it can be placed anywhere in the home. It is fitted with an absorption unit with an economical consumption of only 90 W.

The "McClary-Easy" Division of General Steel Wares, Ltd., have recently introduced their Canadian range of refrigerators to this country. At present this consists of four models—13, 11 and 10 cu ft, and despite the difference in the respective sizes all the refrigerators are only 56in high. The larger refrigerators are fitted with a zero-zone freezer, which holds 50 lb of frozen foods.

A Swiss-made absorption refrigerator, the 2½ cu ft "Harper," is marketed by John Harper & Co., Ltd. It can be either wall-mounted or used as a free-standing model and is 28in high by 22in wide.

Domestic deep-freeze units are shortly to be introduced by Electro Appliances & Equipment, Ltd. These models will be designed to match the existing refrigerators marketed by the company and will have a capacity of approximately 4 cu ft. The prices are expected to be in the region of 79 gns. Other refrigerators marketed by this company include 4 and 5 cu ft models of Continental origin.

The German-made A.E.G. refrigerators are handled by the Welmec Corporation, Ltd., while from Bauknecht (Great Britain), Ltd., comes the "Beekay" range. These last-named models are fitted with fingertip control,

adjustable deep-freeze compartments claimed to be safe for the long-term storage of frozen foods, etc. When deep-freeze temperatures are not required, the compartment can be

converted to normal freezer storage space.

The "Elin 140" refrigerator marketed by the Rustone Trading Co., Ltd., has a capacity of 4·9 cu ft and a shelf area of 9·1 sq ft. The refrigeration unit is of the sealed compressor type and it is priced at 63 gns. Other companies that import Continental machines are Layford Electrical, Ltd., whose present lines are the "Brandt" 4 and 5 cu ft refrigerators, and the "Arthur Martin" range, which includes 4 and 9 cu ft models.

The German-made Siemens refrigerators are marketed by Lonor, Ltd. Four models are available at the present time, their sizes ranging from 2·9 cu ft up to 9·3 cu ft. The smallest model, the AKT/80, is of the absorption type, while the others are compressor refrigerators. All the models have interior lighting and the doors are lockable.

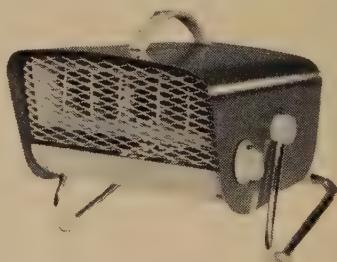
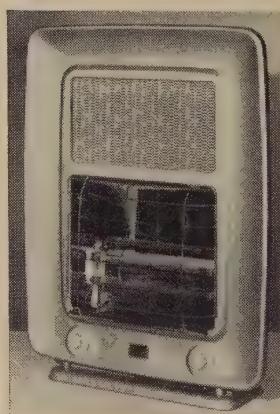
## SPACE HEATING

ACKNOWLEDGED to be the best and cleanest method of home heating, electricity is also a sound proposition on grounds of economy. Furthermore, it is officially approved under the Clean Air Act for use in Smoke Control Areas. Basically, there are two main methods of heating, radiant heating and convection heating, and the many variants and forms of electric heating appliances fall into one or the other of these two categories—or a combination of the two. Apart from the conventional radiant fires and convector heaters, there are infra-red heaters, fan heaters, panel heaters, heated carpet underlays, underfloor warming, block storage heaters, and heat pumps—all electrical methods of home heating.

At this time of the year the demand for all types of heating appliances

grows and there is a marked increase in sales. Manufacturers have been busy during the summer months in preparing stocks and many new designs and models have come on to the market.

One company which is meeting the coming heating season with an increased range of electric heating equipment is E. K. Cole, Ltd. The latest Ekco "Radiant K" heater is similar in style and finish to their popular "K" type convector heaters, except that the new model also incor-

E. K. Cole Ekco  
"Fandair" 2 kW fan heater

Main 761 radiant heater/convector

"Mayhurst" fan heater (Parkinson-Cowan  
Appliances, Ltd.)

porates an infra-red radiant heater. The total loading is  $2\frac{1}{2}$  kW—a  $1\frac{1}{2}$  kW element provides convector warmth with automatic heat control, while the 1 kW infra-red element is controlled by a separate switch. It is finished in hammered bronze stoved enamel and the price is £12 15s.

Another new Ekco heater is the "Fandair" fan heater. This model embodies a high efficiency cross-flow or tangential turbine fan, which is silent in operation and provides a smooth flow of air over a wide area. It is fitted with a 2 kW heating element, and this, in conjunction with the fan, provides for rapid room heating. The heat output and fan speed are controlled by a 4-position switch. The company also produce a wide range of portable radiant fires, and also a neat infra-red wall fire, the "Firestreak." The Ekco "Thermopanel" is an unusual and attractively designed free-standing panel heater. The elements are fused directly on to armour plate glass which has a hammered finish. There are no glowing elements, but a built-in pilot lamp gives the entire panel an attractive flood of red light. The loading is 1 kW and wall mounting models can also be supplied.

Two new fires and a fan heater have been added to the range of home heating appliances produced by the G.E.C. Of particular interest is their free-standing screen fire, which has been designed to cover an existing fireplace opening. It is a combined convector heater and "Cosyglow" fire controlled by three switches, one for the 500 W convector and one each for the two 1 kW elements of the fire. By the use of these switches five varying degrees of heat are available. The other new fire, a portable "Cosyglow," is designed on contemporary lines and finished in black and red. The fan heater, model DM.242, is thermostatically controlled and has a safety cut-out. The total loading is 2 kW and an illuminated grill acts as a pilot light. Red and cream have been chosen for the finish and the price is just under £10.

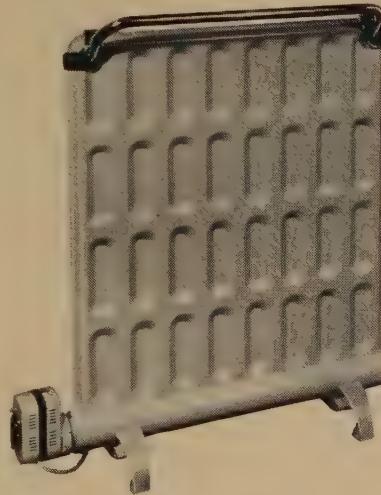
The latest Main electric fire is the model 761 combined radiant/convector heater. A selector switch enables a choice of four heat outputs to be made, or the fire can be thermostatically controlled. The total loading is 2,750 W and it is finished in old silver with a chromium grill.

Parkinson Cowan Appliances recently acquired the sole manufacturing and distribution rights for the "Elfin" and "Mayhurst" fan heaters, previously made by P. W. Baker, Ltd. The "Elfin" fan heater is only  $6\frac{1}{2}$  in high by 11 in diameter and weighs  $5\frac{3}{4}$  lb.

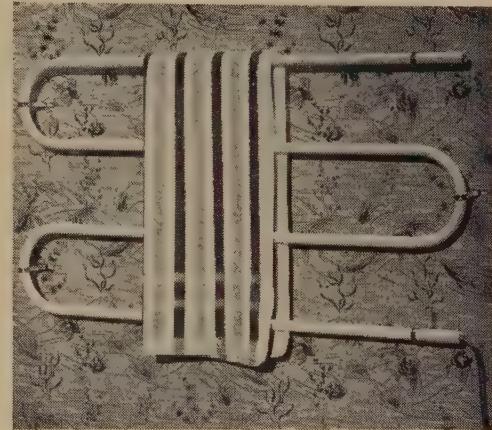
It has a loading of 1,500 W and the finish is in red or mushroom. The larger "Mayhurst" has a maximum heat output of 2,500 W and, although of the same diameter, it measures 11 in high. In addition to red and mushroom, this appliance can also be obtained in gold and black.

Dimplex, Ltd., claim that they can offer a comprehensive range of ultra-safe appliances to meet every heating need in the home. This company's well-known permanently oil-filled electric radiators can be obtained in a number of sizes and loadings. There are now ten models in the range of panel-type radiators with loadings from  $\frac{1}{2}$  kW to 2 kW, while in the column-type range there is a choice of four models—1,  $1\frac{1}{2}$ , 2 and 3 kW. The prices range from £11 16s 6d for a  $\frac{1}{2}$  kW

ised in the manufacture of oil-filled radiators for many years is Hursel, Ltd. Both panel and column types are produced, in sizes from  $\frac{1}{2}$  to 2 kW, and the full range caters for almost every home heating requirement. A new built-in thermostatic control has been designed by Hursel for attachment to their range of radiators. The main feature of the thermostat is a double pilot light. With one light the user is reminded that the radiator is connected but that the thermostat is switched off temporarily. Two lights showing indicates that the radiator is not only connected but also that it has been switched on. The Hursel "Towel-Rads"—oil-filled radiators plus heated towel rails—have proved to be very popular. They have three heated towel rails and the lower sec-



Dimplex model B.48 oil-filled radiator fitted with towelling rail



Hursel universal "U" heater

panel-type, to £41 8s for a 3 kW column-type radiator. All are finished in high gloss stoved enamel and are available in bronze, gold, cream and white, as standard, or other colours to special order. The Dimplex 750 W wall-mounted infra-red heater, with built-in pull cord switch, is ideal for bathrooms and steamy kitchens. The company also produce portable infrared fires in loadings of 750 and 1,500 W. For background heating, Dimplex offer skirting board styled convector heaters in two sizes, 2 ft (300 W) and 3 ft (500 W). When used as the sole means of heating, they can be built-up in multiples by use of connector sets. The company's oil-filled electric towelling rails are available with loadings from 90 to 200 W and prices for these range from £8 17s 6d for the "Minor" finished in stoved enamel, to £15 13s 6d for the "Major" finished in chromium.

Another company which has special-

tion is a 11 in high panel radiator which has sufficient heating surface to warm the average bathroom or kitchen. The universal "U" is the most recent introduction. It is a new type of heating unit suitable for a variety of domestic applications—as a towelling rail, clothes drier or even as a garage heater. It consists of 12 ft of electrically heated tube bent to form a double "U" with an area of 36 in by 19 in. The surface temperature is approximately 160°F and the loading is 110 W. It is finished in white stoved enamel.

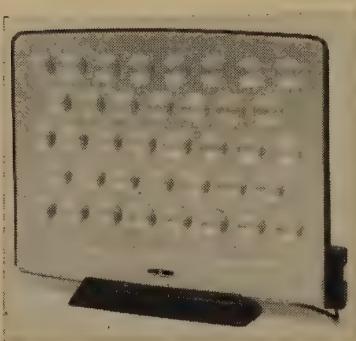
A new fluid-filled radiator, the Crompton "Commodore," has been introduced by Crompton Parkinson, Ltd. It has a 1 kW immersion type heating element sealed into the radiator body and is claimed to be completely safe and trouble free. It is 27 in high by 32 in wide by 6½ in deep on its free-standing base, and its adaptability is augmented by an ingenious

variety of colour finishes. Each side of the "Commodore" is coloured differently and there are three colour combinations to choose from—gold and bronze, grey and pink and eau-de-nil and cream. It is thermostatically controlled and can also be wall mounted. The price, including purchase tax, is £16 9s 6d and a double towel rail is available for £2 19s 6d extra.

The "Stelectric" oil-filled electric radiators are produced in 500 W, 1, 1½ and 2 kW sizes. These appliances, manufactured by Steel Radiators, Ltd., are thermostatically controlled and also fitted with a thermal cut-out. They are available in a range of colours and all models can be supplied on castor wheels.

The Creda Simplex radiator is obtainable as a wall-mounting or free-standing model. This stylish panel heater has a loading of 1 kW and is finished in two two-tone combinations of cream/beige and pink/grey. Other Creda space-heating appliances include a light but sturdily constructed 2 kW reflector fire, the "Cresta"; "Calypso" convector heaters; and the "Cubana" portable reflector fire in either 1 or 2 kW sizes.

The "Wellberry" fire from Berry's Electric, Ltd., has been re-designed to allow it to be installed as a fixed heater. This enables it to qualify for a grant when fireplaces are converted to smokeless fuel to comply with the Clean Air Act. Local authorities, from whom the decision to set up Smoke Control Areas comes, are given power to grant up to 70 per cent of the cost of conversion to electricity or other smokeless fuel provided, in the case of electricity, that the heater is fixed and not portable. Berry's new "Chameleon" model 492 fire combines infra-red heating with a background of slowly changing colour. This latest model follows the modern trend of long, low fireplaces and it can be recessed into a wall or chimney-breast or fitted in a surround. Apart from these new models, Berry's continue with their range of fuel-effect



Crompton Parkinson "Commodore" fluid-filled radiator



Berry's Electric "Wellberry" log-effect electric fire

fires. There are in the region of thirty different types, in 2 and 3 kW sizes. The company also produce a fan heater, the "Solano." It has a loading of 2 kW and provides a current of warm air from its illuminated louvres and heat distribution is through a wide angle. During summer it can be used to circulate cool air.

From Morphy-Richards, Ltd., comes news of three new models, a fan heater, an infra-red heater and a small convector heater. The fan heater, the "Bermuda," can be used either free-standing or mounted on a wall and is priced at £8 18s 6d. It has a 2 kW element, governed by a 3-position switch, and a two-speed fan. The weight is only 10 lb and the finish is in either pearl bronze or charcoal. The original Morphy-Richards fan heater, now named the "California," has a thermostatic room-temperature control and a three-speed fan. This model, which is ideal for large rooms, sells at £12 7s 11d. The infra-red heater is a 750 W model which retails at the competitive price of £4 19s 6d. It can be adjusted to various angles for directional heat and, for convenience, the switch-cord can be positioned at either end of the heater. It is available in three colour finishes and the grill and reflector are chromium plated. The small convector heater also has a 750 W loading and has been

designed for the average small bedroom. It can be used either as a free-standing model or wall mounted, as both wall brackets and legs are provided. It measures 24in high by 16in long and, when wall mounted, it protrudes only 5½in from the wall. A point of interest, when the heater is used in a child's bedroom, is that the pilot lamp can also serve as a night-light. The heater is finished in pastel blue with a pearl grill and the price is £7 19s 4d.

A novel wall-mounting heater has been produced by Carron Company. Known as the "Capella" suite, it is, in effect, an electric fire set in a gold mesh frame, which is finished with a wood surround. The overall size of the surround is 38½in wide by 26in high. Even with the fire switched off, the diffused light is suitable during television viewing or as a cheerful background glow. It is available with either bar or rod type elements and the loading is 2 kW.

A fan heater which incorporates push-button control, giving a choice of three heats and two different fan speeds, is included in the new "Luxury Life" range of appliances being marketed by S. N. Bridges & Co., Ltd. The maximum loading is 2,250 W. The heater has two signal lights, including the exclusive "Neonic Eye," which indicates correct earthing and wiring to the mains. The manufacturers claim that this is the first domestic appliance in Britain to have this safety feature. An automatic cut-out is also included as a further precaution should the heater be accidentally knocked over.

Continuing in popularity is the Jackson 777 convector heater produced by the Electrical Division of Radiation, Ltd. The price, including tax, is £6 15s 5d and the loading is 2 kW. It has an extremely simple but pleasant design and its neutral mushroom finish will tone with most interior decorative schemes. It is just over

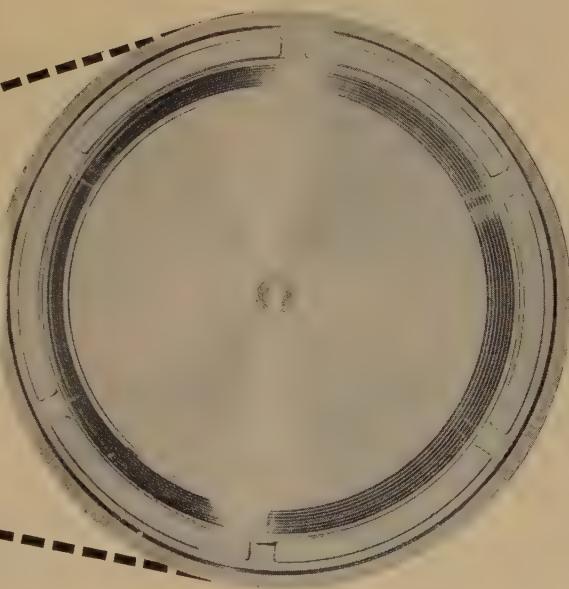


Morphy-Richards "Bermuda" 2 kW fan heater



Carron "Capella Suite" wall-mounting electric fire

# ANOTHER U·M·P



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FOR TUBES AND PLASTICS

18in high by 23in wide by 8in deep (including legs) and weighs only 13½ lb. The Jackson "Masterpiece" convector is designed as a picture frame with expanded metal screen and a centre panel in anodised aluminium. The elements (2 kW) are fitted in the body of the heater. Two models are available, one with a variable control thermostat and the other with a half-heat switch.

Among the most popular heaters produced by the Midland Electric Manufacturing Co. are their "Memvek" range of convectors. These are available in 2 and 3 kW sizes, with thermostat or, alternatively, switch-control on the 1, 2 and 3 kW models. They are available in bronze, mushroom or cream and both portable and wall-mounting patterns are obtainable.

The Hanovia "Turboflo" air circulator-heater employs a tangential fan action which is capable of circulating the air so efficiently over the heating element that a loading of 3 kW can be used in a very small unit. It is only 19in long by 8in wide by 6½in high, and the six-position switch offers the choice of three heats, 750, 1,500 or 3,000 W, and two speeds of cool air. Engelhard Hanovia also announce the introduction of two new versions of their "Radisil" infra-red heater, designed as floor-standing models. Model 33 is the single unit (600 or 800 W), while model 66, a double unit, has alternative loadings of 1,200 or 1,600 W. The company's models 58 and 32 wall-mounting infra-red heaters have been re-designed. A new shape is available for the wall-mounting brackets and a central position switch with a direct downward pull and an on/off indicator have been fitted.

Another company now producing infra-red heaters for domestic purposes are Thermadore (Great Britain). Their latest models are the "Thermadore 77" (750 W) and the "Thermadore 100" (1,000 W). They both measure 25½in long by 6¾in deep and weigh approximately 5½ lb. End knobs are provided so that the angle of the heater may be adjusted and there is also a red arrow safety device which appears as a warning indication when the heater is on.

The "Lan-Bar" electric towel rails, always a useful source of heating for the bathroom, have been improved both in appearance and efficiency. Fluted rails are now used for the heater tubes in place of plain round ones, resulting in not only a non-slip surface but also a greatly increased surface area. The prices, which remain unchanged, range from £14 14s 6d (70 W) to £23 1s 7d (100 W).

The range of electric heating appliances marketed by David C. Lesser



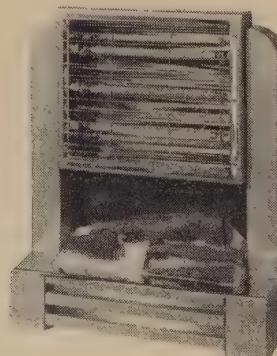
"Radiation-Jackson 777" convector heater  
(Electrical Division of Radiation, Ltd.)



M.E.M. 3 kW "Memvek" convector heater



Engelhard Hanovia "Turboflo" air circulator-heater



David C. Lesser & Co.'s 3 kW log-effect fire

& Co. has been increased by five new models this season. The "Komet" fan heater has now been made available with a pilot light and safety cut-out. Further coal-effect fires in either 2 or 3 kW loadings have been added, as well as a screen fire.

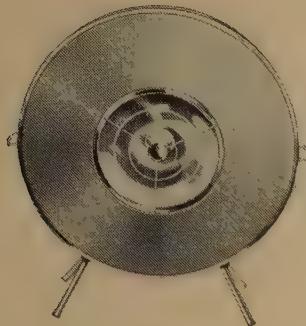
Cranmer & Cheshire, Ltd., manufacturers of the "Nichro" range of heaters, are to fit a wire guard inside of a sheet aluminium guard to their wall-mounting infra-red heaters in future. The guard will be hinged at one end enabling the reflector to be cleaned more easily. Phoenix Appliances, Ltd., have entered the space heating field initially with their "Phoenix" fan heater. It is a two-speed/two-heat model and the price is 8 gns.

A new departure in electric fire design is found in the Heatrae "Ballerina" fire, a free-standing model of contemporary design. It incorporates a 2 kW heating unit, the load being disposed over three rod-type elements and control is effected by a three-heat switch. It is finished in grey and white with black ebonised legs or fawn and grey with natural polished beech legs. The latest version of the company's "Majestic" fire incorporates a similar 2 kW heating unit, also controlled by a three-way switch. Independent of the heating unit of this fire is a cleverly diffused illumination effect which gives a pleasing glow whether the heater is on or not.

The "Panorama" heater, the latest from Thermaire Domestic Appliances, Ltd., is fitted with a convex reflector which is said to radiate warmth through an area of nearly 180°. It is fitted with two extra-long silicon sheathed elements (overall length 20in) and the total loading is 2 kW. It measures approximately 15in high by 25in wide and the finish is in silver grey/beige. The price is £11 19s 6d, including tax.

A new conception in fan heating design may be found in the contemporary styled "Ormond" fan heater. This model, mounted on a Sapele finished screen, may be placed almost anywhere and serves as a decorative addition that harmonises with most surroundings. The maximum loading is 2½ kW and switches are fitted to give half-heat or to operate the fan only.

An incorporated time switch is now available for the whole range of "Kaloric" convectors manufactured by M. & J. Lossos & Co., Ltd. These convectors are offered in two types, the "Kaloric-Mayfair" and the "Kaloric-Sapphire," both in 750 W, 1, 2 and 3 kW ranges.



Sofono combined convector and radiant heater



Ormond Engineering Co.'s model E.1600 fan heater



Electrix model 313 coal-effect fire



Smith &amp; Welstood "Esse Autovector" stove fitted with electric fire front

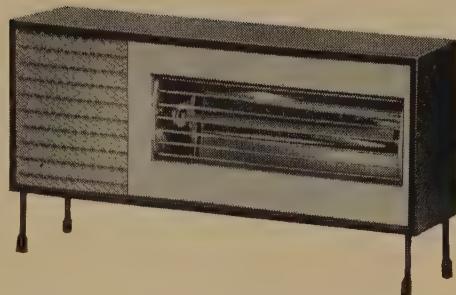
Electrix, Ltd., are marketing for the first time a coal-effect fire known as model 313. It is a 2 kW unit, with independent switching, and is available in silver or bronze. The price is £10 9s 11d. A free-standing infra-red fire, model 316, is also produced by Electrix. This is fitted with three independently switched 500 W elements and is obtainable in four colours—red, mushroom, green or black, at a price of 10 gns.

The price of the "Everest" fan heater, marketed by Merseyside Engineering, Ltd., has been reduced to 9 gns. This particular model is fitted with two thermostats and completely variable fan speeds. Another model, the "Everest Automatic," is controlled by press-buttons only. It incorporates three-step heating and has a maximum output of 2 kW with two-speed ventilation.

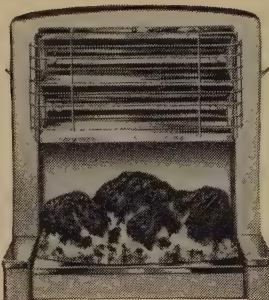
An electric fire specially designed for fixing on the front of solid fuel stoves in summer, has been produced by Smith & Welstood, Ltd., manufacturers of the "Esse Autovector" and R. design "Courtier" stoves. They are obtainable in 1, 1½ and 2 kW sizes and, when not in position in the stoves, they can be used independently elsewhere.

The quick heating advantages of a fan heater, combined with the glow of an infra-red heater, are incorporated in the Westool new space heater. It is fitted with a single-speed fan and three heats (800, 1,200 and 2,000 W) are obtainable. Any one of these heats can be used alone or in conjunction with the 750 W infra-red heater. It is 25in long by 13in high (including legs) and is finished in attractive neutral colours. The switches are push-button operated and are mounted on the side of the heater, together with a circuit indicator pilot lamp. The price is 15 gns.

Gordon Miller, Ltd., have produced an attractive new selection of fires under the title the "Masterpiece" range. The "Rembrandt" model is of special interest, with its combination of a 1 kW quick-heat element, 2 kW integral heat and an air circulator, plus a realistic coal or log effect. The "Rubens" model does not have an air circulator but may be used independently of its coal effect, if desired. Both these last-named fires are designed to fit any standard fireplace. The "Van Dyck" is an outset fire also with coal or log effect, with a 2 kW loading. The company's two "Constable" models are single bar infra-red heaters, one of 900 W loading and the other 1,200 W, which can be used either free standing or wall mounted.



Westool combined fan heater and infra-red heater



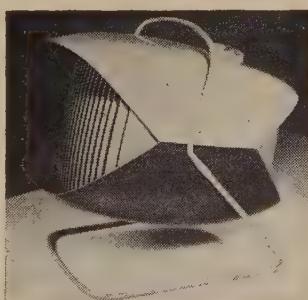
Gordon Miller "Van Dyck" coal-effect electric fire



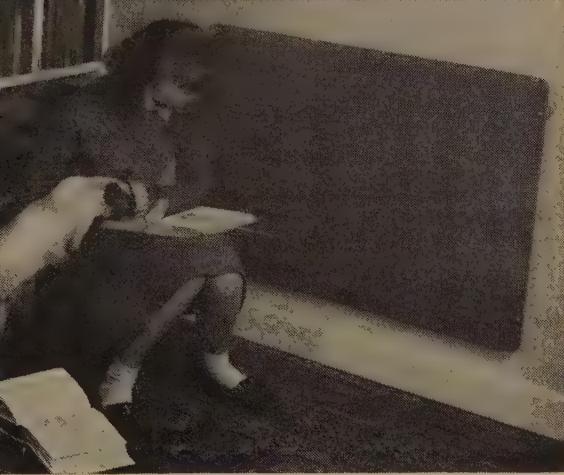
Thermodare wall-mounting infra-red heater



Thermair "Panorama" 2 kW heater



Truvox "Novalux" fan heater



Morheat satin finish "Saturn" 500 W heating panel shown in a typical domestic setting

The "Sofono" Electrical Division of Federated Foundries now produces a wide range of electric heaters, including "Saturn" reflector fires, "Jupiter" infra-red radiant heaters and "Space-master" convectors and reflector/convector heaters. The "Space-master" is of most unusual design—completely circular and mounted on four metal legs. It is approximately 25in in diameter and is finished in either gunmetal or flame with the reverse panel in cloud grey. 1 and 2 kW models are available, as well as the reflector/convector, which additionally has a built-in 750 W reflector fire.

Another attractive appliance is the "Novalux" fan heater. The manufacturers, Truvox, Ltd., consider that the volume of air circulated is of primary importance and should be in the form of a broad flat beam. Consequently, the rear of the "Novalux" is open and this, combined with its styling, is claimed to provide maximum air intake and correctly formed air output. A single dial controls both two-stage heating (1 or 2 kW) and two-stage cooling. The finish is in ivory and coral with gilt louvres and its stand is adjustable.

One of the lowest priced convector heaters (just under £3) is marketed by A. J. Flatley, Ltd. The loading is 1,200 W and it is available in a range of three colours with an attractive hammer finish.

The "Braun" turbo heater distributed by the Brattel Electric Co., Ltd., is not unlike a portable radio in appearance and can, in fact, easily be carried in the hand to be placed just where it is needed—on the floor, table or bookshelf. When in operation, air is drawn through the intake grill on the top of the cabinet and ejected through the outlet grill on the front. A rotary control switch gives either cool air or three degrees of heating, 500 W, 1 kW or 2 kW. It is thermostatically controlled and its compact size makes it suitable as a hair dryer. The price is 12 gns.

Electric panel heaters provide the



Isopad under-carpet heater

solution to many room heating problems and one company which produces this form of heater in several different sizes is Wright Electric Motors (Halifax), Ltd. The loadings available range from 500 W to 1,500 W and the heaters are sold complete with wall-mounting brackets, fixing screws and a 6ft length of 3-core flexible. The standard finish is white, green, grey or cream stoved enamel, but other coloured finishes are obtainable.

A non-metallic "Mhoglas" low temperature heating element which is made of fibreglass impregnated with colloidal graphite, is used in the range of heating panels manufactured by Morheat, Ltd. These panels can be made to operate on any voltage and the surface temperature (normally 170°F) can be reduced to suit any particular purpose. The panels do not require to be earthed because non-conductive materials are used in their construction. The domestic models are made in three sizes, the "Saturn" (500 W), the "Venus" (300 W) and "Mercury" (50 W). The larger models are available in a reeded or satin finish in five attractive colours, while the smaller "Mercury" is in a reeded silver grey finish only. Apart from these, the company produces both wall mounting and free-standing models (loading 300 W), suitable for use as towel rails, as well as a 150 W version fitted with plastic covered

handles and frame for use as a hot-plate. All the heaters have been E.D.A. approved and the prices range from £2 5s for the "Mercury" to 10 gns for the "Saturn."

Under-floor heating is becoming increasingly popular in new domestic premises. It has not, of course, reached the scale that it has attained in commercial and industrial premises but as more and more new houses are built, so greater use is being found for it. It has the advantage that electricity can be used during off-peak times, thus securing the benefit of reduced tariffs. Basically, it consists of heating wires or cables embedded in a concrete floor, which are heated up, usually during the night hours, and discharge their stored heat during the day.

For those who may prefer heating of this type, but find that in their existing houses it is impracticable, the method of floor heating by means of a heated carpet underlay may be of interest. These underlays are usually made in the standard carpet sizes and the loading is approximately 100 W per sq yd. Several companies now produce them, including Thermalay, Ltd.; the Davill Manufacturing Co., Ltd.; Isopad, Ltd.; and Milliwatt, Ltd.

A more personal form of heating which might deservedly be mentioned in a review of electric space heating appliances is the electric blanket. The fact that there are now well over 200 different models from which to make a choice is an indication of their popularity. Space does not allow us to mention each manufacturer's



Brattel "Braun" 2 kW turbo heater



Wright Electric Motors "Safeheat" panel heater



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products individually but it may be of interest to note that there are now in the region of 40 manufacturers, the majority of whom produce "Kite-marked" blankets, that is, blankets that are produced fully in accordance with the requirements of British

Standard Specification 2612. In order to comply with this Standard, electric blankets have to pass fifteen tests, each of which calls for a high standard of mechanical and electrical construction and ensures the safety of the product in ordinary conditions of use.

## WATER HEATING

THE problem of getting a constant and adequate supply of hot water for domestic purposes, at all times of the day or night, is easily solved by electricity. It can be achieved in several ways and there are types of water heaters to meet all needs. One of the most popular ways, and probably the

heater should be sufficient. Immersion heater design has varied little over the years and there is virtually nothing to report in the nature of new developments. There are approximately a score of different manufacturers and between them models are produced to meet most of the variations likely to be encountered in domestic plumbing systems.

One of the largest manufacturers is Santon, Ltd., which produces models ranging in size from 10in (immersed length) to 42in. Another company that has been specialising in the manufacture of immersion heaters for a number of years is the Aidas Electric Co., Ltd., who produce both non-withdrawable and withdrawable element types. George Bray & Co., Ltd., manufacturers of the "Tubalox" range, have re-designed their type LAQD models so that the heat is now lower, making them more suitable for mounting in confined spaces. This company also produce special heaters

From the dozen or so manufacturers of electric thermal storage water heaters, models are obtainable in various sizes ranging from the smaller sink models ( $1\frac{1}{2}$  to 3 gallons) up to the larger 30 and 40 gallon water heaters.

A small model in  $1\frac{1}{2}$  and 3 gallon sizes, suitable for use at the sink or wash basin, is produced by Berry's Electric, Ltd. Both are designed to occupy as little space as possible and the finish is in white, cream, blue or green. Another company supplying a water heater suitable for use over the kitchen sink or wash basin are the G.E.C. Their "Superspeed Double-Two" water heater is fitted with a thermostatically controlled 2 kW heater and has a capacity of 2 gal. The finish is in cream and white or honeysuckle with red, blue, green or grey colour bands. The G.E.C. also produce a large 20 gal dual-purpose floor-standing water heater. It is fitted with two elements, one at the top of 3 kW to keep 5 gal of water always ready for use and one at the bottom, also 3 kW, which can be switched on whenever a larger quantity of hot water is needed.

A water heater of unusual shape was introduced earlier this year by the Modern Equipment Co., Ltd. Styled the "Sinomatic," it breaks away from tradition in that the outer case is composed of spun aluminium and the shape is not unlike an egg. The capacity is 2 gal and there is a choice of either 2 or 3 kW loadings. It is thermostatically controlled and a neon indicator light is fitted. The design is unspoiled by connections and all fitting is from the fixing bracket side of the heater. The standard finish is in white or cream stoved enamel, while a de-luxe model is available in anodised gold, red or blue.



Heatrae "Lidomat" water heater shown mounted under a wash basin unit

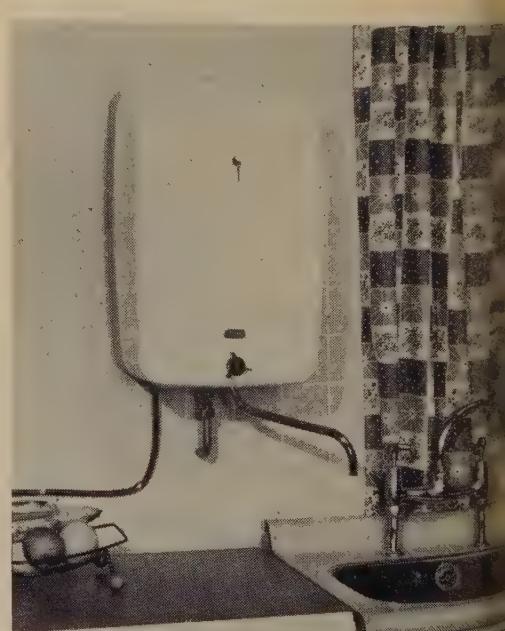
most effective method, of providing hot water at the bath or sink taps is the immersion heater. Alterations to the existing plumbing system are not usually necessary and the actual installation costs are comparatively low. Immersion heaters also have the advantage that they may be used alone or in conjunction with a solid fuel heating system. Two types are available—the removable element design, in which the heating element can be withdrawn without first emptying the tank, and the embodied or non-withdrawable pattern. From the point of view of efficiency, there is little to choose between the two. Both are made for fixing either vertically or horizontally. For an average household tank, usually with a capacity of from 20 to 30 gal, a 3 kW heater would probably be the most suitable. Where the tank size is 20 gal or less, a 2 kW

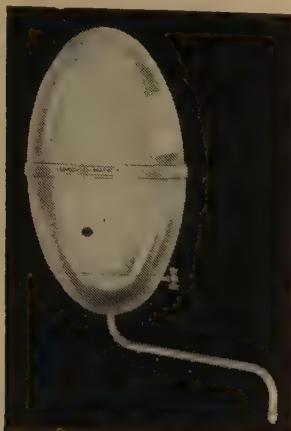


Berry's model AQ/3 3 gal water heater

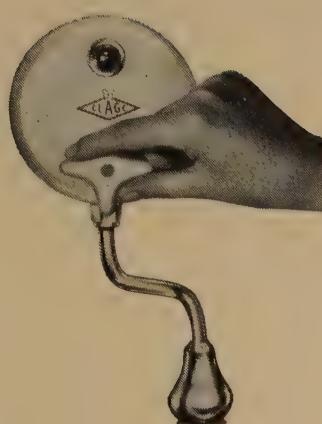
intended for horizontal fixing, for use in hard water areas.

With the thermal storage type of electric water heater, hot water can be stored ready for immediate use and, when a supply is drawn off, it is replaced within a short space of time.





Modern Equipment Co.'s "Sincomatic" water heater



I.C.G. "Super Clage" instantaneous water heater



G.E.C. "Superspeed Double-Two" 2 gal water heater

One of the latest appliances to be introduced by the Electrical Division of R. & A. Main, Ltd., is the "Main 25" water heater, a storage model with a capacity of  $2\frac{1}{2}$  gal. It has a loading of 2 kW, thermostatically controlled, and a feature of the heater is the ease with which servicing or maintenance may be carried out. Removal of the front casing (held by four screws) permits access to all interior parts. Two types are available: model 25A with a water control tap built into the heater, and model 25B, in which the control is incorporated in an "Economy" plumbing kit, obtainable as an extra.

The Electrical Division of Radiation, Ltd., produce the Jackson "Jill" models. These are in two sizes,  $1\frac{1}{2}$  and 3 gal, and are obtainable in a choice of colour finishes—all white, all cream, or with turquoise blue or eau-de-nil base covers. Both heaters employ a simple 3-point fixing with rubber seal for flush fitting to the wall. The base cover and apparatus plates are easily removable, giving access to all component parts for maintenance purposes.

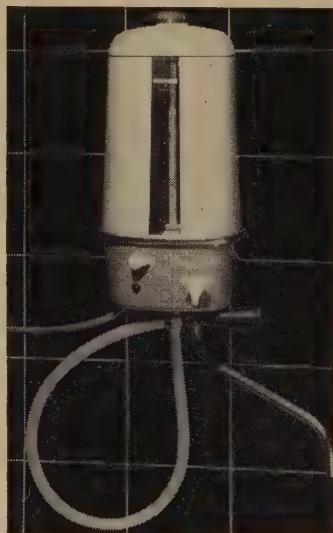
The Heatrae "Lido Express" model is fitted with either a 2 or 3 kW element. This loading is higher than normal and the makers claim that up to 9 gal of hot water an hour can be continuously provided. Another feature of this heater is the "Economy Eye"—a pilot light which gives visual indication of when the current is on. The Heatrae "Lidomat" water heater is the basic unit upon which the company's range of "Lidomatic" water heaters are designed. The loading is 3 kW and again this high loading, combined with efficient thermal insulation, ensures rapid heating of the water. It is available in cream, white or grey finish.

The Simplex "Creda Corvette" water heater is unusual in that the

main body of the heater is of glass. It is designed for fixing on the wall or windowsill near the kitchen sink, and is capable of providing up to a gallon of water, from warm to boiling, within a short space of time. It is filled with cold water by means of an adjustable hose from any convenient water tap and any quantity of water up to a gallon can be heated. A 3 kW element is fitted in the base and above this is the main body, or flask, of heat-resisting glass, graduated in pints. A pilot light is provided to indicate when the set temperature is reached. For tea making purposes, a whistle warning sounds when the water is boiling. Simplex also produce other water heating equipment, including the 3 gal "Creda Crusader," a neat wall-mounting storage water heater, and a range of single-point and multi-point storage type heaters in sizes up to 100 gal.

Instantaneous electric water heaters are designed to give an instant and continuous supply of hot water for all normal kitchen sink and wash basin requirements. Such a heater, the "Super Clage," is obtainable in this country from I.C.G., Ltd. It is of Continental origin and measures only 5in in diameter and is designed to be connected to a water tap union and to any convenient 13 or 15 A socket outlet. The water is heated by a 3 kW element and safety is ensured by a thermal action cut-out which is designed to switch the heater off when the water temperature rises above 150 to  $155^{\circ}\text{F}$ . Running costs are said to be economical as the unit requires no pre-heating and electricity is consumed only when water is drawn off. Other companies marketing an instantaneous water heater are Grimwood (Croydon), Ltd., who distribute the "Infrasol," and Plow Water Heaters, Ltd., who sell the "Watermatic."

The "English Rose" electrically



Simplex "Creda Corvette" wall-mounting water heater

operated heat pump provides an adequate supply of hot water for the bath and sink and, in addition, serves as a refrigerator and an air cooling system. The heat pump utilises heat drawn from the outside atmosphere, solar radiation and the refrigerator unit. When abnormal demands on the hot water supply are made, a booster can be switched on. The heat pump is housed in the lower half of a stove enamelled cabinet (the upper half is occupied by the refrigerator) and the complete cabinet is 66in high by 30in wide by 24in deep. The manufacturers claim that it is capable of supplying 500 gal of hot water ( $140^{\circ}\text{F}$ ) per week at an approximate running cost of 10s. The normal speed of water heating varies according to the ambient temperature but, on average, this works out at approximately 5 gal per hour. The normal loading of the heat pump is 850 W and the maximum intermittent rating with booster is 2,850 W.

## LAUNDRY

THE home laundry provides more scope for electrical labour saving devices than does any other branch of the household activities. Manufacturers have recognised this fact and tremendous progress has been made in the manufacture of home laundry appliances. During the past ten years the proportion of housewives who own washing machines has increased from 2 per cent to nearly 25 per cent. There are many types and sizes of washing machine, ranging from small models which accommodate up to about 5 lb dry weight of clothes to the medium family-sized models with a capacity of up to 10 lb.

In the past two years or so the trend has been away from the separate washing machine towards a unit which both washes and spin dries the clothes. Several of these combination machines are now on the market and one of the latest is the A.E.I.-Hotpoint "Supermatic." Introduced originally in Scotland, distribution has now been widened and it is now available in most areas of Britain, including London and the Home Counties. An exclusive feature of the "Supermatic" is a filter cleaning system, which constantly circulates the washing water through a filter tray, thus ensuring

that the clothes are cleansed in water free from fluff, etc. The washing tub holds up to 9 gal of water and washes between 4 and 6 lb dry weight of clothes at one time. It is fitted with a thermostatically controlled 2.3 kW heater. The spin dryer, which is mounted alongside the washing tub, is capable of dealing with a 6 lb dry weight load of clothes. It is fitted with a transparent domed lid and the act of opening it applies a braking system to the spinner drum. The control panel incorporates coloured bands which indicate the correct washing time and water temperature for the various types of fabrics to be washed. Twelve minutes is the maximum washing time required but the user has, of course, complete freedom of choice of both the temperature and washing time selected. The complete machine measures 32in high (34in over control panel) by 30in wide by 18in deep. The finish is in white or cream stoved enamel and the whole is mounted on castors for easy manoeuvrability. The price is 85 gns.

The Burco "Twenty-One" combined washing machine and spin dryer, also introduced this year, has a stainless steel washtub, with detachable lid, and a plastic agitator. In it a 5 lb dry weight load of clothes can be washed, the manufacturers claim, in under ten minutes. It is fitted with a two-heat immersion type element (2,500 W for high and 750 W for low settings). A safety cut-out is fitted to prevent overheating. Separate motors permit a second load of clothes to be dealt with while the first load is in the spin dryer. The spinner is lipped at the top to prevent garments being pushed out and its motor drive is controlled by the opening and closing of the lid. The machine is finished in white or cream with a blue trim and the dimensions are 30½in high by 31½in wide by 18¾in deep. The price is 79 gns and a laminated plastic table top is available as an extra.

The G.E.C. combined washing machine and spin dryer, the "Double Plus," has been designed with the small kitchen in mind. It occupies a space of only 21in by 24in. It has an unusually shaped tub with two pulsators mounted in the bottom and a tapered spinner drum for rinsing and spin drying. The manufacturers claim that the shape of the washing vessel has the advantage of ensuring that all the clothes are actively washed as there are no "dormant" corners. The machine incorporates a 3 kW heater for raising the washing water to



Bylock combined washing machine/spin dryer

A.E.I.-Hotpoint "Supermatic" combined washing machine/spin dryer



Parnall "Auto-Dry de Luxe" tumbler dryer (Electrical Division of Radiation, Ltd.)



G.E.C. "Double-Plus" combined washing machine and spin dryer

boiling point. As the dual pulsators are mounted in the bottom and not the side, as little as 5 gal of water may be used for a small wash (maximum load 11 gal of water). The height of the machine is 32in and a table top has been designed by the company so that even the small amount of room occupied by the "Double Plus" becomes extra table space. The table top is available in a choice of three colours—red, blue or biscuit—and sells at £3 5s extra. The "Double Plus" costs £83 9s 6d.

The Parnall "Spinwasher" produced by the Electrical Division of Radiation, Ltd., is a single tub washer-rinser-spinner which occupies a floor space of 22in square. It stands 36in high so that its tub is flush with the standard sink unit. It is fitted with a timer which gives control of the washing and spinning actions. The rinsing is carried out on an untimed cycle by an exclusive "Clear-Flo" method and there is also an outer compartment that stores hot water and suds for



re-use. As all the operations take place in the one tub, the housewife need never handle the clothes until they have been spun dry. It is available in a white or cream finish and may be obtained either with or without a heater. The "Auto-Dry" tumbler dryer is another of this company's products. It is provided with three-heat control and from its rotating drum clothes come out with just the right degree of dampness for ironing in less than an hour.

An average family wash of four loads can be completed in half an hour, at an average time of under eight minutes per load, in the "Hoovermatic" combined washing machine and spin dryer, claim Hoover, Ltd. The first 6 lb of clothes are washed, rinsed and spun in ten minutes but, as the "Hoovermatic" spins while washing, subsequent 6 lb loads can be completed every six minutes or so. A timer controls the washing period, switching off automatically when the pre-set time is reached. Rectangular in shape, styled in white, blue and grey, the "Hoovermatic" is 31½in high by 29½in long by 16½in deep. It can be supplied with or without a heater. The company announced earlier this year that all future "Hoovermatics" will be fitted with a new lid at no extra charge. The lid has a working surface of a hard plastic material with grey and white mottled pattern and the sides are of aluminium alloy. Lids for existing "Hoovermatics" are available at £3 17s 6d each. The company's washing machines, like the "Hoovermatic," also have the exclusive Hoover pulsator "boiling action." All have stainless

English Electric "Liberator" washing machine and dryer shown as a compact home laundry unit



steel tubs and are automatically pump emptied. There are two versions of the basic machine without the spin dryer, known as Mks. II and III, equipped with a hand- and a power-operated wringer respectively. All Hoover washing machines can be supplied with or without a heater. In the company's "Spinarinse" spin dryer the clothes can be rinsed as well as spun without being removed from the machine. With it, too, hot suds can be returned for further washing use, if required. The Hoover range of home laundry products is completed with the "Steam-or-Dry" iron.

The "Adamatic" washer/dryer manufactured by Ada (Halifax), Ltd., is a heated machine with a capacity of 5 lb dry weight of clothes. The standard finish of this machine and the company's "Coronation" washing machine is cream or white.

The latest English Electric washing machine is both mobile and fully automatic. This machine, the "Liberator," deals with between 6 and 7 lb dry weight of clothes at one time. Once its two controls have been set, it automatically heats the water, washes, rinses up to four times, spin dries and switches off. A dialling position for spin drying only is provided. No permanent plumbing is needed, it being necessary only to connect it to the cold water supply by a tap adaptor provided. A 2,750 W immersion heater is fitted, although, as it can also be connected to a household hot water system, a hot water hose is also supplied. A safety feature is the provision of a removable door handle, which is designed to prevent the door being opened when the machine is in operation. The overall height of the machine (with extra base fitted) is 36in and it is 25in wide by 22in deep. The price is 105 gns. The "Liberator" automatic tumble-dry clothes dryer has been designed specifically to dry synthetic fabrics with a minimum of creasing, as well as woollens, cottons and linens. It can be set to either a high or low temperature by means of a two-heat switch and an automatic timer gives up to two hours of drying time, including a cooling off period. When the drum is revolving, a fan draws air through an inlet duct at the back of the machine. The air is passed over the heater (2,750 W high or 2,000 W low), through the gently tumbling clothes and out through a vent on top of the cabinet. The "Tumble-Dry" is identical in appearance and dimensions to the "Liberator" automatic washing machine and can be placed alongside or stacked on top to form a compact and attractively styled home laundry unit. It weighs



Burco "Twenty-One" combination washing machine/spin dryer

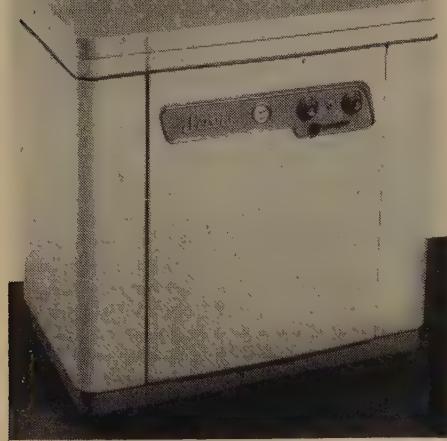


Bendix "Gyramatic" model GH fully automatic washing machine

about 150 lb and the price is £60 18s.

Automatic washing machines produced by Bendix Home Appliances, Ltd., range from the "Dialamatic" dial-controlled machine priced at £85 1s, to the "Gyramatic" model GH, costing £120. Other models include the "De Luxe," priced at £99 15s, and the "Gyramatic" model PH, at £109. All these machines are fitted with a 2½ kW water heater. The dial-controlled machines have the advantage that they do not require special plumbing—connections to the water supply and waste are made by means of flexible hoses. All Bendix models are available in white or cream.

Within the past few weeks Bylock Electric, Ltd., have introduced the "President" combination washing machine. It is provided with separate pumps for the washer and spinner and is designed to deal with a 5 lb dry weight of clothes at each loading. A 2 kW heater is fitted and there is an



Servis "Supertwin" washer/spin dryer

automatic safety cut-out. The finish of the cabinet is in white stoved enamel and there is a laminated plastic table top. It measures 30½in high by 32¼in wide by 17¾in deep and the price is 60 gns. Bylock additionally market a spin dryer, also styled the "President," in which up to 6 lb dry weight of clothes can be accommodated at one

by 31½in wide by 20in deep and the price is £82 19s (with heater) or £78 15s (without heater).

The "Gay Day" washing machine/spin dryer marketed by Zeta Domestic, Ltd., is fitted with a 3 kW immersion heater and deals with 6 lb dry weight of clothes per load. On this machine the controls are mounted on the top of the cabinet and neon indicators show the selected circuit in operation. It can be provided with a heat resisting table top (optional extra) and the price is 79 gns. Another of the company's products is the "Gay Day" electric wash boiler. This is in two sizes, 5 gal and 7½ gal, and each is controlled by a three-heat rotary switch.

The newest addition to the "Everest" range of appliances marketed by Merseyside Engineering (Refrigeration), Ltd., is the "Majestic" combination washing machine/spin dryer. This is a completely automatic

automatic single-tub washing machine; Electro Appliances & Equipment, Ltd., who market several makes of washing machines and spin dryers; and the Rustone Trading Co., Ltd., who recently introduced the "Alba-Cygnus" combined washing machine and spin dryer.

The "Trident" three-in-one home laundry unit, also of Continental origin, was first distributed in this country by Plieger (London), Ltd., during the summer months. It combines all the functions of washing, rinsing and spin drying within its single 8½ gal capacity tub and occupies a space only 31in high by 18in square. The washing action is unusual in that the agitator, being fixed to the washing tub, drives the water through the clothes and not the clothes through the water.

Another company which imports several Continental appliances are the Welme Corporation, Ltd., who market the A.E.G. "Lavalux" combination



"Alba-Cygnus" washing machine (Rustone Trading Co.)



Merseyside Engineering "Everest Karomatic" washing machine/spin dryer



Simplex "Creda Debonair De Luxe" spin dryer

loading. It has a transparent plastic lid and side carrying handles are fitted.

Washing machines, spin dryers and a combined washer/spin dryer are all included in the range of "Servis" home laundry appliances manufactured by Wilkins & Mitchell, Ltd. Their latest model is the "Servis Supertwin" washer/spin dryer. The washing tub of this machine has a reinforced plastic agitator that produces a "wide-sweep" washing action—210° sweep 64 times a minute. The tub holds 8 gal of water and takes a large wash at each loading. A special feature of the spin dryer is that it has a "deep rinse" action which enables the clothes to be thoroughly rinsed before being spun dry. This machine measures 33in high

twin-tub laundry unit that boils, washes, rinses, spin dries and is self-emptying. The capacity is between 8 and 9 lb dry weight of clothes. It measures 32in high by 31in wide by 19in deep and is finished in vitreous enamel with an aluminium table-top lid. Apart from this machine, the company also market the "Karsomatic" and "G-Matic" combination washers. The "Karsomatic" now incorporates several major improvements, including a re-designed spin dryer section. Other changes include the addition of an automatic cut-out.

Several other companies import Continental-made home laundry appliances, including the Layford Electrical, Ltd., who market the "Brandt 4500"

washer/dryer and several spin dryers. Lonor, Ltd., sell the German-made Siemens appliances, among which there are washing machines, spin dryers, rotary ironers, etc.

As will be seen from the foregoing, there are many combined washing machines/spin dryers on the market and, consequently, the number of self-contained spin dryers has not grown to any great extent. Several manufacturers, in fact, have considerably reduced the prices of their current models, in some cases by as much as £7 or £8. The Simplex Electric Co., Ltd., have just introduced a completely new spin dryer to be known as the "Creda Debonair De Luxe." The original "Debonair" (now to be known

as the "Debonair Popular") will, in future, sell at the reduced price of 22 gns. The new model has many new features, including an automatic pump and rinsing facilities, and this is priced at 29½ gns, including tax.

Frigidaire are retaining unaltered their spin dryer, model A-1000, which was introduced last year. This particular model is claimed to be the only one on the British market with an automatic timing device. Opening the lid not only cuts out the motor but also applies the brake, while, at the same time, it re-sets the cut-out mechanism automatically, ready for the next load to be spun. The price of this model has been reduced by 5 gns to 23 gns.

Another automatic spin dryer is the "Mainspin," manufactured by Morley Products (Padham), Ltd., and marketed by the Electrical Division of R. & A. Main, Ltd. It is a compactly designed round machine, available in either cream and green or white and

ances, Ltd. This model has a 750 W heater in the lid of the machine, which provides a current of warm air to help the drying process. The capacity of the machine is between 6 and 7 lb dry weight of clothes and the price is £37 3s 6d.

Apart from spin dryers, and there are many other manufacturers on the market, there are also several tumbler drying machines. One is the Burco "Tumblair," which is fitted with a 90-minute automatic timer. It has two separate 1 kW heating units (one controlled by the automatic timer and the other switched on manually to provide extra heat when required). It is a cabinet model and the dry clothes capacity of the machine is 5 lb.

Yet another form of clothes dryer is the airer/dryer or drying cabinet. These appliances take varying forms but all work on the same principle—the clothes are suspended either on rods within a metal cabinet or extend-

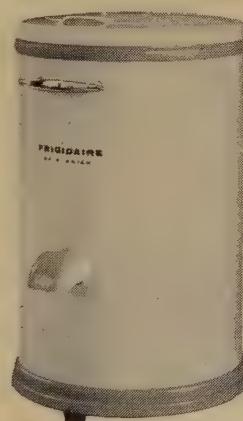
"Babylux" clothes dryer, also produced by Aerialite, sells at 9½ gns, including tax. The company also market the "Rota-Rinse" spinner-rinse dryer.

The "Thermat Airdry" airing and drying cabinet is adjustable to give extra height for blankets, etc. The maximum loading of this machine is 1,750 W and the 6in fan is claimed to circulate approximately 125 cu ft of air per minute.

The "Drip-Dry-Air" drying cabinet, a product of Burco, Ltd., is claimed to be the only one of its type marketed in this country in which dripping wet clothes can be hung with absolute safety. It is a cabinet type appliance, fitted with plastic covered rails, and, for drying longer clothes, overalls, raincoats, etc., an extension rail is provided. A draining spout is fitted at the front. It is fitted with a fan unit and heating elements (1,700 W) and measures 36in high by 21½in wide



"Gay Day" combination washing machine  
(Zeta Domestic, Ltd.)



Frigidaire model A-1000  
spin dryer



Aerialite "Rota-Rinse" spin dryer

blue. The inner tub is copper plated and it takes between 6 and 7 lb dry weight of clothes. The Morphy-Richards "Astral" spin dryer is a cabinet model which occupies only 2 sq ft of floor space. This also has recently been reduced in price.

Other cabinet-shaped models are made by Goblin (B.V.C.), Ltd., who produce the "Spin-Quick," and by Parkinson Cowan Appliances, Ltd., manufacturers of the "Pirouette" spin dryer. This last-named model will take up to 8 lb dry weight of washing and is finished in white or cream stoved enamel with blue or red fittings.

The only heated spin dryer on the market is the "Thermair," manufactured by Thermair Domestic Appli-

cable racks, at the base of which a heater is fitted. A useful feature of these appliances is that they also serve to air the washing after ironing and some cabinet types can also be used as convector heaters.

The "Luxuria" drying cabinet manufactured by Aerialite, Ltd., is typical of these appliances. Basically, it consists of a stove enamelled metal cabinet at the base of which are fitted three 600 W elements. A specially designed motor-driven propeller rotor in a miniature wind tunnel creates a forced draught effect. The washing to be dried is hung on rods and suspended from the top of the cabinet. This model is priced at 20 gns, including purchase tax, while a smaller

Burco "Drip-Dry-Air" drying cabinet

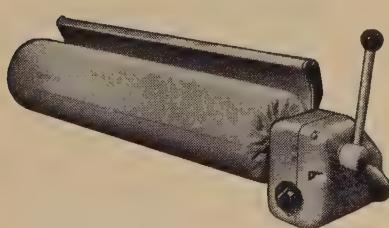


by  $19\frac{3}{4}$ in deep. The top cover provides an extra working surface when the machine is not in use. The finish is in white or cream stoved enamel and the price is £21 14s.

Electrix, Ltd., have added a new model, the 319, to their range. This has a detachable lid and switches are provided for alternative loadings of 500, 750 and 1,250 W. It is finished in white or cream with red trim and the price is £9 19s 6d. Only one model is at present being marketed by the Victor Manufacturing Co. (Green-gates), Ltd.—the "Victor De Luxe" clothes dryer. The loading of this model is 1,500 W and it has a hinged working top for easy handling and use. It is fitted with five plastic covered rods. Other features include an indicator light, fitted castors and a thermal cut-out. Rippingilles, Ltd., are now producing a clothes dryer and their latest model, the "R-Dri," is available in 1,000 W and 1,250 W sizes.

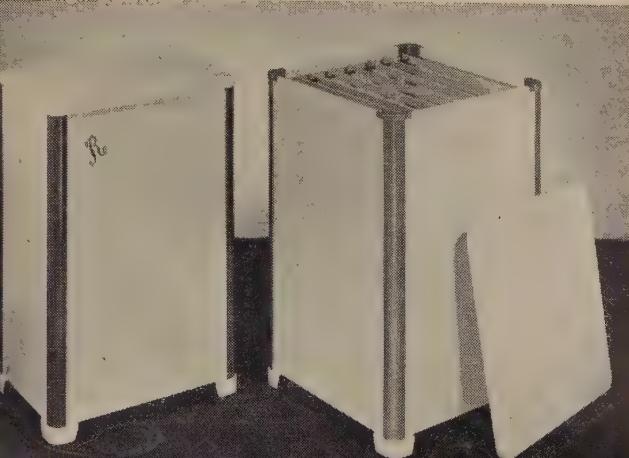
Two slim heating panels, both thermostatically controlled, together form the "Saldon" electric clothes horse, manufactured by Saldon Products, Ltd. The panels measure only  $\frac{1}{4}$ in thick and have hinged hanging rails on both sides, on which clothes to be dried or aired can be hung. Each panel is fitted with a neon indicator light and an on/off switch.

The "Dryette" clothes dryer and airer, a product of the Coventry Radiator & Presswork Co., Ltd., occupies only a small amount of floor space and can be folded away when not in use. The cabinet will dry the equivalent of a 5 to 8 yd clothes line, depending upon the size of the articles.



"Ada" rotary ironer (Ada (Halifax), Ltd.)

Rippingilles "R-Dri" electric clothes dryer and airer



It has a loading of 1 kW and nine rails are fitted.

Apart from being used as a normal clothes dryer, the "Swift" model manufactured by the Ardleigh Spraying Co., Ltd., can be used as a convector heater and is even considered to be safe enough to use in the nursery. It is a 1,250 W model and the price is £8 15s 6d. "Cotto" (Scunthorpe), Ltd., produce a de-luxe fan drying cabinet and the latest model has push-button switches and an indicator light. The company have also introduced a re-designed heating element assembly and the loading has been increased to 1,750 W.

The Inferation clothes dryer takes the form of a wall cabinet and, when mounted, the projection is only  $2\frac{1}{2}$ in. The four heated panels of the dryer open out and it is on these that the wet laundry is hung. The heating element is a flat sheet, laminated into protective coverings, and is completely sealed into the metal panels. The total loading is 600 W. The appliance is finished in either pink, blue, yellow or white and it measures 23in high by 25in wide when closed. The price has recently been reduced to 19 gns.

Since it was first introduced four years ago, the "Flatley" clothes dryer has undergone several modifications and improvements, including price reductions. The latest model is fitted with a 1,200 W element and the internal fittings include a safety grid to prevent the over-heating of articles which may, inadvertently, fall. As before, the cabinet is finished in gleaming white or cream stoved enamel and the overall size is  $34\frac{1}{4}$ in high by 20in wide by  $15\frac{1}{4}$ in deep. The price, including purchase tax, is £6 19s 11d. Other laundry appliances produced by A. J. Flatley, Ltd., include a washing machine priced at only 17 gns, complete with wringer. This washer, known as the model 110, will accommo-

date  $3\frac{1}{2}$  lb dry weight of clothes and holds  $5\frac{1}{2}$  gal of water.

There is little to report otherwise from the twenty or so other washing machine manufacturers—most seem to be content with their existing models or are tending to concentrate on the development of combined washing machine/spin dryers. The same may be said for electric wash boilers. There is still a demand for this item of home laundry equipment, but the increase in the number of heated washing machines and twin-tub machines is apparently the reason why no new models have appeared on the market.

No home laundry review, however, would be complete without mention of the wherewithal to deal with the final process—ironing. The electric iron is probably one of the most common items of electrical equipment and it is estimated that it is used in over 90 per cent of the homes wired for electricity in this country. Altogether there are two dozen or so manufacturers and between them they produce many types, including automatic, non-automatic, and travelling irons. Undoubtedly the most popular is the automatic iron which incorporates a bimetal thermostat controlled by a heat regulator, and, in most cases, a pilot light.

A name that is perhaps as well known as any in connection with electric irons is Morphy-Richards, Ltd. This company produces several models, including a lightweight iron and a steam iron. Steam irons are also produced by Hoover, Ltd., who first introduced their "Steam-or-Dry" iron to this country in 1953. Best Products, Ltd., are also makers and their latest model is the "Steam-o-Matic" iron.

The larger rotary-type ironers, although not as common as their hand-held counterparts, continue to be marketed. The "Ada" rotary ironer produced by Ada (Halifax), Ltd., can



Inferation wall-mounting clothes dryer

be interchanged with all the company's washing machine wringers and is also available as a pedestal model. It has an easy to use, one-hand operation and the length of the roller drum is 26in. Morphy-Richards also produce a rotary ironer, which is fitted with a

foot-operated control, leaving both hands free to guide the ironing through the machine. A flat bed type ironer, the "Parnall Ezypress," with an ironing surface of 274 sq in, is available from the Electrical Division of Radiation, Ltd.

## CLEANING

THE cleanliness of any home is of the utmost importance and the possession of some form of cleaning appliance is essential. Electric vacuum cleaners have nowadays come to be regarded as one of the main methods of dealing with this particular household chore—in fact, nearly seven out of every ten wired homes in this country make regular use of them. Not only is it a quick and thorough way of cleaning, it is economical too—the running costs are practically negligible. Also, if treated carefully, the vacuum cleaner is an appliance which should last for many years.

Basically, there are two types of vacuum cleaner—cylindrical and upright. A third type, much lighter and smaller, can be held in the hand. Hoover, Ltd., produce all three types. Their model 652 is a de-luxe upright machine designed for the larger household. It is a highly versatile cleaner, capable of cleaning not only carpets but all other types of surfaces. The cleaning tools attach instantly by means of a specially designed connector and are sold complete with the machine. The handle can be released by a foot-operated latch and is adjustable to three positions. The outer dust bag of this machine is of reinforced plastic, while the motor housing is of a rigid plastic—both can be easily cleaned. The finish is in pearl white and heather rose and the price is £36. Another upright model is the Hoover "Junior" cleaner, model 1334. A full set of cleaning tools is also available with this machine and, like the model 652, it is equipped with "Hooverflex" double stretch hose. Other cleaners in the Hoover range include the spherical "Constellation," model 862, a powerful suction cleaner fitted with a 580 W motor. The price of this cleaner is now only £18. The two Hoover "Dustette" portable models have been re-styled in a new colour scheme of pearl white, combined with a dark blue bag which takes a more rectangular shape. A feature of these portable machines is a strap which fits through a slot in the carrying handle and enables the "Dustette" to be slung over the shoulder, thus making it easier for the user to lift

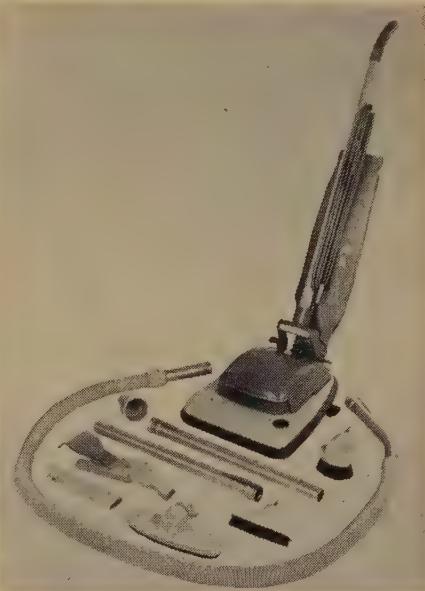


*Electrolux turbo-polisher attachment*

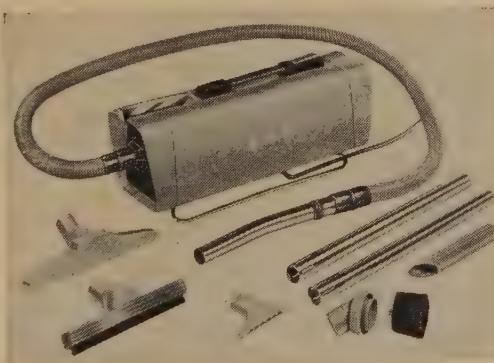
small pieces of furniture and to guide the cleaning tools.

With the model 65 Electrolux cleaner the housewife can carry out all her everyday cleaning with the aid of only two tools. For cleaning purposes use is made of an accessory which combines a carpet nozzle and a floor brush. Having used this in the normal way for cleaning carpets, a simple toe-

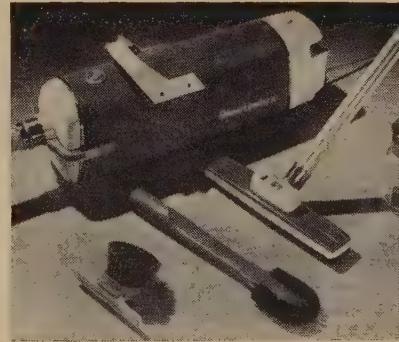
metal skids for easier manoeuvrability. The price of this cleaner is just under £30. A turbo-polisher attachment, operated by the airflow of the cleaner, converts the model 65 into a highly efficient floor polisher. It is fitted with a detachable weighted shoe for floor polishing and, when fitted, this gives just the right weight for polishing floors without effort or pressure. Without the shoe, the accessory becomes



*Hoover model 652 de-luxe vacuum cleaner*



*G.E.C. model DM.540 vacuum cleaner with accessories*

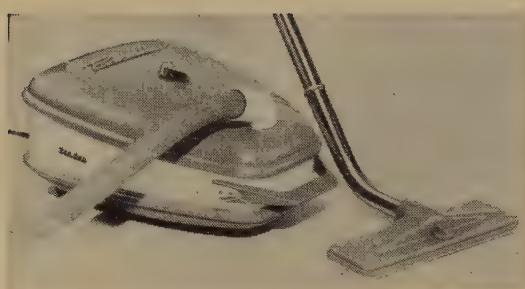


*Electrolux model 65 vacuum cleaner with its attachments*

action on the end of the tool snaps the nylon brush into position for use as a floor brush. For more concentrated suction the whole tool can be reversed. Another ingenious tool can be used as a dusting brush in one position and, when reversed, two wings are opened to form a small nozzle for cleaning curtains, stair carpets, etc. A crevice nozzle, with a brush attachment, is also supplied, as well as a sprayer and carpet shampoo. The motor, rated at 450 W, is double insulated and other refinements include nylon rollers and

a lightweight polisher, suitable for polishing furniture or even a car. It has two sets of brushes—hard brushes for waxing and soft brushes for polishing—as well as felt and sheepwool buffers. The price of the attachment is £8 5s 3d.

Another recently introduced Electrolux cleaner is the "Electrux 64," a complete all-purpose model with a vynide covered cylinder in sepia and ivory two-tone finish. The tools include a two-way carpet nozzle, floor and wall brush, dusting brush, small



Parnall "Vibrabeat" vacuum cleaner  
(Electrical Division of Radiation, Ltd.)



Phoenix Appliances "Cyclone" cleaner  
with accessories

nozzle and a crevice nozzle. It is driven by a 350 W double insulated motor and the price is 19 gns.

No new models have been added to the Electrolux floor polisher range, the most recent being their B.9 model. This is a triple-brush polisher with "floating" suspension which makes the brushes self-adjusting to the irregularities in a floor surface.

Two types of cleaner are produced by the General Electric Co., Ltd., a lightweight upright model, the DM.380, and a cylindrical type, the DM.540. The upright model is fitted with a plastic handle which contains no electrical connections—an automatic switch operates when the handle is raised or lowered. The attachments available with this machine enable the user to clean stairs, upholstery and walls, as well as carpets. A full range of attachments is also included with the cylindrical model, which is attractively finished in moonstone grey and red. Both are equipped with double insulated motors. The floor polisher produced by the G.E.C. is a two-brush model. The bristles are splayed for polishing in corners and are easily removed for cleaning. It is supplied with two felt pads and, for additional gloss, lambswool buffers are available.

The Hotpoint model 420 cleaner is claimed to be the lightest upright example available. The weight is only  $10\frac{1}{2}$  lb. The wheels have a two-position adjustment for deep pile carpets and for linoleum and tiled



A.E.I.-Hotpoint model 420  
vacuum cleaner

floors. The height of the brush is adjustable to four positions. This model, which has always been available in the popular maroon colour, can now also be had in red and green. The attachments have been redesigned and they include a crevice tool, upholstery nozzle and general purpose brush. The price of the cleaner is 21 gns plus 4 gns for attachments.

A comprehensive range of cylindrical cleaners, ranging in price from £8 19s 6d to £15 17s, are produced by the Siroma Engineering Co., Ltd. One of the company's latest models is the "Siroma 900." This is a competitively priced cleaner (13 gns) which has modern styling and is supplied with a wide range of cleaning tools. Another popular selling appliance, state the company, is their hand cleaner, model HC.1022, while their



Rudson Wood & Co.'s Peugeot  
"Airbrosse" vacuum brush

Brown Brothers "Duco" "Competition" vacuum cleaner

upright model (price £15 4s 7d) is in steady demand.

A low-priced "Competition" model vacuum cleaner has been added to the "Duco" range, obtainable from Brown Brothers, Ltd. It is a cylindrical cleaner covered with leather-finish cloth, and it is driven by a 250 W motor. The accessories include a flexible hose, two extension tubes, oval brush, carpet nozzle and a crevice tool. The price is £8 19s 6d.

Phoenix Appliances, Ltd., now market six models of vacuum cleaners, including the "Flamingo" cleaner. This can be used as a hand cleaner or converted into an all-purpose household machine by fixing an extension handle. Other models produced by Phoenix include the new "Cyclone" cleaner and the popular Mk. II, as well as a two-brush floor polisher.

The "Juno" domestic polisher/scourer, manufactured by Truvox, Ltd., is claimed to be the only domestic machine available for polishing, burnishing and scouring. The Mk. IV model has a steel body finished in chromium or cream stoved enamel with black trim. With its accessories the machine becomes a complete floor treatment machine, since it waxes, polishes, buffs, scours and sands. The total weight of the machine is  $16\frac{1}{2}$  lb—light enough to carry but heavy enough to exert the right polishing pressure. Goblin (B.V.C.), Ltd., continue with their successful range, which includes both cylindrical and upright models, as well as a small hand cleaner. No new additions have been made this year.

One of the latest Bylock Electric suction cleaners is the "Centurion De-Luxe," a high powered (500 W) cylindrical machine available in a two-tone grey finish. This model is fitted with a "balanced suction" reversible swivelled carpet nozzle. In action, this nozzle glides effortlessly over thick pile or rubber-backed carpets



without suction clinging. The secret, claim the manufacturers, is in a valve which automatically maintains the correct air flow.

The latest addition to the "Summit" range of vacuum cleaners marketed by Edmundsons Electrical Wholesalers, Ltd., is the "Aristocrat," priced at 11 gns. A full set of accessories is available for this machine, which has a silver grey mottled finished body with dark red enamelled end caps. A clip under the body of this cleaner enables it to be hung in a cupboard. The "Summit" floor polisher, a two-brush model, is also sold by this company.

The vacuum cleaner produced by the Electrical Division of Radiation, Ltd., is shaped on the lines of a portable typewriter. This lightweight model, styled the "Parnall Vibrabeat," measures approximately 8½in high by 13in wide by 20in in length. It consists of pressed steel upper and lower shells, which form the casing in which is contained its 500 W motor and the dust

bag. It has a full set of accessories, including a special attachment for deep cleaning, known as a "vibra-beater." The cleaner normally operates in a horizontal position for room cleaning purposes but it can be stood upright when in use on stairs. The price is £28 10s.

Several companies are importing Continental cleaners, including Standard Sales, Ltd., who market the "Cadillac" convertible vacuum cleaner; and Lonor, Ltd., sole distributors in the United Kingdom of the German Siemens range of cleaners and floor polishers.

Of interest is the French Peugeot "Airbrosse" vacuum brush marketed by Rudson, Wood & Co., Ltd. This small, hand-held cleaner is suitable for cleaning coats, suits, upholstery, etc. It is extremely light and compact. Two small screens slide away to empty the built-in dust bag. A plastic nozzle can be fitted for cracks which are not so easily accessible. The price is £5 12s 6d.

## LIGHTING

THE domestic lighting field offers manufacturers more scope for variety in design than any other section of the realm of lighting. Apart from its obvious practical use, lighting can also provide an aesthetic and decorative effect. The variety of fittings which are now available cater for all tastes and there is now probably a greater choice of fittings on the market than at any other time. In the space available it would be impossible to review all of this vast collection; instead, we shall endeavour to give a brief description of some of the latest designs.

Fittings to harmonise with almost every possible kind of decoration scheme, whether traditional or modern, are produced by Knightshades, Ltd. Ceiling fittings, floor lamps, wall brackets, and a wide range of pendant type decorative fittings are included in this company's new season's list. The most recent addition to the range is a five-light pendant decorative fitting (model 325) with arms in polished brass with wood centre in walnut finish. This fitting, which has glass shades in pink or champagne, has a 28in spread and is priced just under £10. Also new is a matching 2-light wall bracket, model 1931, with an overall width of 12in. A decorative fitting for use with silica lamps (model 329) is another new Knightshades design. This also is a 5-light pendant fitting, which has polished brass arms with decorative leaves and flowers in

black, red or white. The company also produces several fittings of the conventional type in wrought iron with matching wall brackets, as well as lampshades in a variety of sizes and colours.

Merchant Adventurers of London, Ltd., produce the "Ellipse" series, a range of shallow opal glass units. These are available as recessed, flush to the ceiling, wall bracket, flexible or tube pendants and the glasses can be supplied in closed or louvred, with or without reflectors. The metalwork is of anodised satin silver or pale gold aluminium, and the reflectors are stove enamelled in a range of colours. Another new development of interest is the 100 W "Ventura" series, where a small 9in diameter diffuser has been introduced to match the popular 12in size (200 W). This whole range can now be supplied for ceiling mounting or suspended from existing ceiling roses and shallow or deep coloured reflectors are available. The "Drum" series is the Merchant Adventurers' latest range of simple metal spinnings from 5 to 18in in diameter for 60 to 200 W lamps. The units, which produce good downward illumination, are fitted with a white opal plastic louvre which achieves a 40° cut-off and prevents the lamp from being seen. They can be supplied for ceiling or pendant mounting individually, or arranged effectively in various group mountings. The metalwork is finished in stove enamelled colours.



Fittings from the Merchant Adventurers "Drum" series range

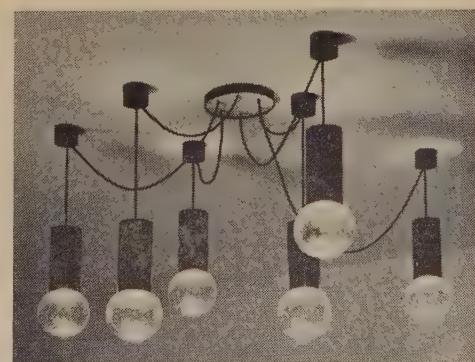
Since the last time lighting fittings were reviewed in this section, Atlas Lighting, Ltd., have entered the decorative lighting field with the introduction of their "Chelsea" range of hand-wrought fittings. The glass units of these fittings are in seven basic shapes and six colours and each is interchangeable. They are held in position by a metal spider assembly, within a slim black cylinder. Silvered



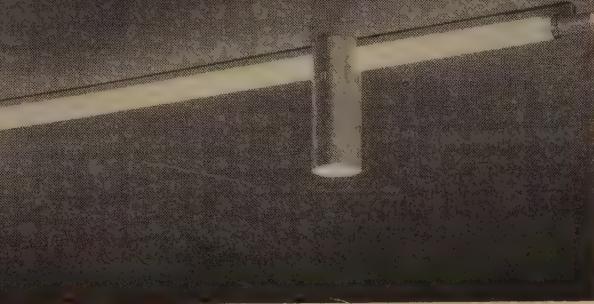
Osborn Manufacturing Co.'s No. 327/219 contemporary 3-light ceiling fitting

reflector 60 W mushroom type lamps are used and these have the effect of illuminating the glass without revealing the light source.

The Osborn Manufacturing Co., Ltd., have, for many years, specialised in household lighting fittings and their new season's range will contain many



A 6-unit cluster from the Atlas "Chelsea" hand-wrought glass lighting fittings range



G.E.C. "Slendora" fluorescent fitting

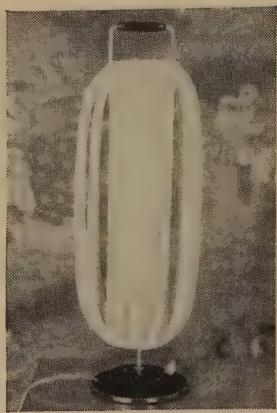
new and novel ideas. Apart from suspended pendant fittings, wall brackets and table lamps, the company produce a range of wrought iron lanterns designed either for chain suspension or for wall or post mounting. The contemporary 3-light ceiling fitting (illustrated) has polished brass metalwork and the moulded glass shades are attractively finished with red and white stripes. This fitting, No. 327/219, has a matching table lamp and a wall bracket.

Cone Fittings, Ltd., as their name implies, produce a range of conical lighting fittings with shades made from either spun aluminium or pleated, washable acetate. They are obtainable in several colours and serve as desk lamps, wall lights or multi-light pendant fittings.

Plastics have done much to widen the range of "eye appeal" of many fittings and an example may be found in the G.E.C. "Gaylon" range. Attractive, yet inexpensive, they are produced in several sizes of pendant fitting, as well as a table standard. They consist of elliptical plastic bowls, the top bowl being white and serving as a diffuser. Both bowl halves are secured by means of an external detachable polished brass ring and the finished result makes a gay addition to the décor of any room. More recently, the G.E.C. have announced a larger pendant fitting. It is all white and is designed to accommodate either a 150 or 200 W lamp.

Several new items have been introduced by Duncan, Partners & Price, Ltd. Among them is the "Regency" range of pendant fittings produced as either 1-, 2-, 3- or 5-arm types. Again, use is made of plastics in these fittings, the bowls being made of an unbreakable poly-opal plastic material. Also new is the "Harlequin" wrought-iron lantern and the "Cascade" table lamp. This last-named model is of unusual design (illustrated) and is claimed to give first-class lighting without glare. A feature of this company's fittings is their competitive prices and the fact that all the items are individually cartoned and can be made ready for fitting almost immediately.

A range of domestic lighting fittings in which the lamps are screened by a

Duncan, Partners & Price  
"Cascade" table lamp

Twin wall-light from Cone Fittings latest range



The latest Falk, Stadelmann table lamp

small satin opal glass shade is produced by Fredk. Thomas & Co., Ltd. The shade is a clip-fit into the conical metal holder of the fitting. Several variations of multi-light ceiling fittings, wall brackets and even multi-light floor standards are obtainable by using a combination of these. A feature of this company's table standards is their heavy white satin glass bases. These bases are illuminated and this, together with the silk shade light source, combine to give a pleasing, as well as decorative, light.

A new range of American designed table lamps and floor standards has been introduced by Falk, Stadelmann & Co., Ltd. The new floor standard

has a white base and real walnut wood stand finished with a one-piece white opal plastic shade, intended for a 100 W lamp. The light is reflected by a metal top cover through the walls of the shade, resulting in a glare-free light. A table lamp, styled to match, has a switched white base and a polished brass stand. The shade is finished matt black on the outside and, together with a white plastic shade diffuser, gives even glare-free lighting which can be rotated through almost 360°.

A range of artistic Danish lighting fittings suitable for ceiling, floor standard, or table lamp use, are marketed by the G.B.M. (Electrical) Birmingham, Ltd. A pleated washable plastic material is used for the lantern and ceiling light, both of which are available in a range of colours. The floor standard has a raffia shade and is in two-tone colours.

From Denmark, pendant and wall bracket fittings are obtainable through Grubert of Copenhagen, Ltd. This company imports both contemporary and traditional fittings. A company that has specialised for a number of years in the manufacture of lighting fittings in antique wood and wrought-iron is Kiroline Products, Ltd. These fittings have their own appeal, particularly as depicted in the company's "Boudoir" range, so styled for their distinctive elegance. Many of the fittings are waxed either in a natural or dark finish and some of the best effects can be obtained in their wall brackets and rough-hewn lanterns.

Apart from its decorative effect, lighting in the kitchen has also a strictly utilitarian value. The latest "Junior Brite-Glo" packaged ceiling fitting manufactured by Courtney, Pope (Electrical), Ltd., is of interest to those who like a well-lit kitchen. It is a single fluorescent fitting from which is suspended a 6ft by 2ft framework into which three diffusing panels are fitted. The framework is suspended by chains and the panels are easily removable for cleaning purposes.

Another popular kitchen lighting fitting is the Atlas "Kitchenlight," a fluorescent lighting fitting which is suspended from the ceiling from a rod. It is supplied complete and ready wired with starter/ballast lamp and is finished in red enamel and semi-matt black.

The G.E.C. "Slendora" fluorescent fitting can be used in the kitchen or arranged in pattern formations in large areas. This fitting consists of a slender grey channel, which houses the wiring, and a yellow shade for a tungsten ballast lamp.

## MISCELLANEOUS

TURNING now to the smaller items of domestic electrical equipment, we find that there are many appliances that may deservedly be mentioned but which do not necessarily fit into the foregoing classified sections. The electric hair dryer, for instance, is one of the more useful portable appliances from the feminine point of view. There are just over a dozen different manufacturers in this country producing models to suit all tastes. Most manufacturers offer their own individual design but the majority of hair dryers are basically the same, consisting of a plastic moulding which houses the fan, motor and heating elements.

An exception to this form of design may be found in the hair dryer produced by Southern Airframe Products, Ltd., which has a cast metal casing finished in cream stoved enamel with chromium surround. The business end of this model measures 5in in diameter, which enables a larger heating element and a larger fan to be incorporated for quicker drying.

Electrothermal Engineering, Ltd., market five different models, including the "Solis 97," a small dryer of unusual tubular design weighing only  $1\frac{1}{4}$  lb. A popular model is that produced by Morphy-Richards, Ltd. Apart from ivory, a colour finish favoured by most manufacturers, this is also obtainable in blue or red.

The Pifco "Princess" hair dryer is one of the few new models to be placed on the market within recent months. It is available in attractive pastel shades of pink, blue and ivory and accessories include a matching plastic table stand, a hair drying hood with hose and unions, and a special comb attachment. The accessories are at present sold separately, but a presentation pack containing the complete ensemble will be available later this year. The price of the hair dryer is £3 3s.

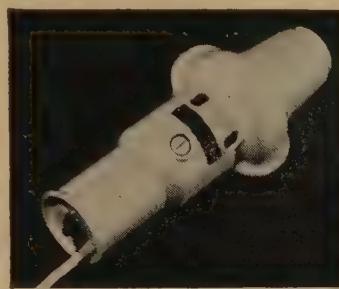
The General Electric Co., Ltd., offer two models, the larger "DM.395" with an element loading of 515 W and the smaller "DM.397A" with a loading of 370 W. The last-named model is available in honeysuckle, pink or blue.

The Ormond hair dryer is supplied in a matching plastic casket provided with a fitted mirror, comb and a holder which enables the dryer to stand firmly in an upright position when in use. This is obtainable in shades of cream, pink or blue.

Just recently S. N. Bridges & Co., Ltd., have marketed a new model, the design of which enables it to be used

in the hand, stood on a table or hung on a wall. There is no need for an extra stand. This "Luxury Life" hair dryer is available in three pastel shades.

Other manufacturers of hair dryers are L. G. Hawkins & Co., Ltd., who produce the "Fair Lady" model complete with a plastic hood and presenta-



Electrothermal Engineering "Solis" model 97 hair dryer



S. N. Bridges "Luxury Life" hair dryer



Schick "3-Speed" dry shaver in case



Chilton "New Sportsman" de-luxe dry shaver

tion case, and the Bestfrend Electrical Co., Ltd., who include in their range the "Mitey" lightweight dryer which weighs under 1 lb.

Electric dry shavers have for many years been popular in America and more recently they have become accepted in this country, although there still remains a large market for them. For the first time since the war the American-made "Schick" dry shavers have been offered for sale in this country. A new company, Schick Inc. (U.K.), Ltd., has been formed and they are producing two models—the "3-Speed" and the "Customatic." The "3-Speed" has a selector switch which provides a choice of three different speeds and a shaving head with three settings for depth of shave, giving nine adjustments in all. This is available either as a single- or triple-voltage model. The "Customatic" is a three-speed single-voltage shaver which has a similar type adjustable shaving head and is presented in an attractive travelling case. Light grey is chosen for the finish.

Morphy-Richards, Ltd., have also now entered the dry shaver market with the introduction of a vibrator/foil type shaver. It has an angled clipper bar for moustache trimming and is fitted with a dual voltage range switch. It also has a built-in on/off switch. The price of £3 10s includes a holder, in grey polystyrene, which can either be mounted on the wall or used as a carrying case when travelling. The shaver is fitted with a 5 A two-pin plug and a b.c. adaptor is also included in the pack, together with a cleaning brush. Another low-priced shaver (£2 17s 6d) has been introduced by Chilton Electric Products, Ltd. This model, known as the "New Sportsman De-Luxe," is suitable for a.c. supplies only and also employs a vibrator type motor. The outside casing is moulded in black and ivory and the shaver, together with a cleaning brush, is contained in a neat black and cream presentation case.

A battery-driven dry shaver, the

Pifco hair dryer with comb attachment



"Lord Riam," is produced by B. H. Ries, Ltd. Another model, the German-made A.E.G. "President," marketed by the Welme Corporation, Ltd., is fitted with a non-spill storage battery which can be charged from time to time from any a.c. socket outlet.

The German Siemens "Cleanmaster" is also operated by a rechargeable battery. This model is offered by Lonor, Ltd., who additionally market a tandem-cutter model. This shaver has two cutters of equal length, a trimming cutter and a shaving cutter, and they operate simultaneously to ensure a clean shave.

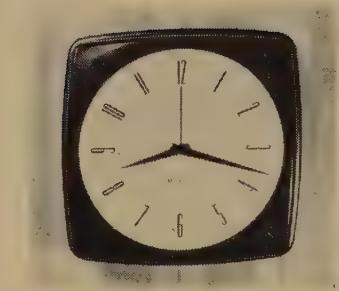
Apart from the new hair dryer, mentioned earlier, Pifco, Ltd., have also made two additions to their dry shaver range. One model, styled the "Prince de-Luxe," is a dual voltage shaver in a presentation case and a special feature is the provision of a spare cutting head and foil. The price is 6 gns. The company also introduce a "Holiday" battery-operated shaver at a price of £2 12s 6d.

To enable a mains operated shaver to be used off a battery there is the Valradio "Shave Aid." This step-up transformer can be connected to either a 6 or 12 V car battery and, the manufacturers claim, battery current consumption is negligible. It is fitted with a built-in switch and the price is £3 18s.

A wide variety of electric clocks are available. One of the largest British manufacturers are Smiths Clocks & Watches, Ltd., whose current range of "Sectric" models covers all types, including alarm clocks, mantel clocks, wall clocks, etc., and new models have been produced this year.

The three latest additions to the Westclox range are all wall clocks. One of these, the "Carousel," is a neat flush-fitting model. The outer casing is finished in red, primrose or eau-de-nil, with a gold coloured trim, and it is priced at 3 gns.

The "Kienzle" clocks marketed by B. H. Ries, Ltd., are operated by ordinary 1.5 V flash lamp batteries.



Westclox "Carousel" electric wall clock



"Sunray" battery driven electric clock from the B. H. Ries "Timemaster" range

Several attractive models are in the range, including a wall clock with silver finished zodiac symbols instead of numerals. The "Timemaster" battery-driven clocks are also marketed by B. H. Ries, Ltd. The latest types include "Sunray" clocks, both oval and round models, which have gilt raised numerals with brass bezels. The round "Sunray" clock (illustrated) is 13in in diameter and the price is £12 12s 10d.

Chimes, bells, buzzers, illuminated push-buttons and bell transformers of all types are produced by V. & E. Friedland, Ltd. An improved design of the "Big Ben" door chime, which was first introduced ten years ago, was announced earlier this year. The new model, much slimmer in appearance, has improved sound quality. Its ivory cover is designed to blend with any decoration scheme and it measures only 7in by 4½in. V. & E. Friedland also produce a door chime kit, which

consists of a "ding-dong" bell in an ivory plastic casing, together with a push-button, 36ft of twin bell wire and all the necessary fixing screws and staples.

Another company to market door chimes is Morphy-Richards, Ltd., who produce the "Lincoln" model, suitable for either battery or mains supply, and the "Gloucester" range, which gives a distinctive chime for the back, as well as the front door.

With the introduction of the Clean Air Act, a demand has been created for an electric firelighter. To meet this demand, the G.E.C. has recently developed a firelighter that has no smoke or flame but quickly ignites a fire by blowing hot air over the fuel in a grate. The firelighter has a fan, similar to the type used in domestic hair dryers, which blows air over a 1,800 W heating element. The air passing over the element coils is raised to a temperature of about 800°C, at which it will ignite domestic fuels. Safety is the major feature of the design of the firelighter and, to prevent accidental switching on, or to avoid misuse by children, it will operate only by the use of a key. After the firelighter has been in use a short time, the element is switched off and only cold air is delivered to fan the fire. This also cools the nozzle of the firelighter so that, unlike other fire-lighting devices, it can be removed from the grate cold. The device operates from any suitable 13 or 15 A socket outlet and, at the moment, is obtainable from Electricity Boards only. The price is in the region of £5.

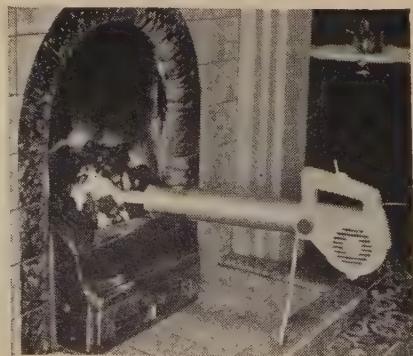
Another newcomer to the electric firelighter field is the Hockley Electric Co., who produce the "Hockley" firelighter. This model is fitted with two 500 W elements, wound on ceramic formers, which are inserted into outer ceramic sleeves. Unlike the G.E.C. model, which blows hot air into the fuel, this firelighter is placed in the fireplace and the fuel to be ignited is heaped around it. The manufacturers estimate that approximately twenty minutes is required for coal to be ignited and thirty minutes for other fuels. The price of this appliance is £1 18s.

With the "Electrikindler" firelighter, produced by Lupus Electrical Products, Ltd., once the fire is well alight an automatic cut-out comes into operation. This model is priced at £4 4s 10d and an asbestos stand, designed to facilitate storage after use, is also available.

Unlike other parts of the house, the kitchen is subjected to considerable variations in heat and humidity. A well-ventilated kitchen can, however,



Hockley Electric firelighter



G.E.C. electrically operated firelighter

be simply achieved with the aid of one of the several window extractor fans that are now on the market. One company that have specialised in this type of equipment for a number of years are Vent-Axia, Ltd., and their present range of ventilating units includes the "X" type models, which move the air in one direction only, and reversible types. They are obtainable in four sizes with impellers of 6, 7½, 9 and 12in diameter.

Metway Electrical Industries, Ltd., market several models, their most recent being the "Coolerway de Luxe" extractor fan. This is much the same in appearance as the company's "Coolerway Royal," except that this model is reversible and is fitted with a capacitor start motor.

The "Comet" extractor fan produced by Hillman Electric Motors, Ltd., can be fitted into any normal window, requiring an aperture of only 5in diameter. It has a 6in blade and gives efficient ventilation without draughts, due to a fixed metal cover which completely shields the exterior of the fan.

The "Min-ex" extractor fan measures 8½in in diameter and is simple to fit either in the window or wall. This fan, manufactured by Jones & Stevens, Ltd., has an extraction rate of 6,000 cu ft/hr, when fitted with its normal 30/40 W motor. If increased extraction is particularly required, the manufacturers can fit a larger 45 W motor, claimed to give an extraction rate of 9,000 cu ft/hr. Two new "Super Min-ex" fans are under development and production is expected to commence in November. One model will be a standard extractor and the other a reversible intake/extractor unit. The fans will incorporate many refinements, including a transparent external adjustable front.

Other sources of supply for these useful appliances are S. I. Engel & Co., who import the "Calor" model; Hogan & Wardrop, Ltd., who market the Dutch "E.M.I." two-speed fan; and the Tack Organisation. This last-named company produce the "Nu-Aire Junior," a 6in model finished in a range of gleaming enamel colours. The fan is made entirely of aluminium and the electricity consumption is only 35 W.

A small, easy to fit, electric kitchen fan ventilator, complete in one unit, is produced by Greenwood's & Airvac Ventilating Co., Ltd. This model, the "Mechavent 75," has been designed specially as a wall-mounted fan assembly to provide a simple and effective means of ventilating relatively small places. The inside grill measures less than 12in square and in an



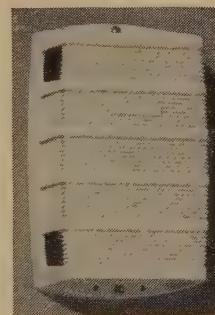
Wolf "Safetymaster" double-insulated power unit



Revo "Jobber" electric drill

average kitchen, the manufacturers claim, it will completely change the air approximately fourteen times an hour. The work of the ventilator can be helped by a combination canopy, which traps the fumes as they rise from the cooker.

Jobs around the house can be greatly simplified by the use of electric tools. The Wolf Electric Tools, Ltd., range for the domestic user is based upon the company's "Safetymaster" double-insulated power tool and the "Cubemaster" ¼in electric drill. Both of these have specific attachments for use with them and also an extensive range of attachments which can be used with either. The "Safetymaster," being double-insulated, can be used without



V. & E. Friedland "Big Ben Mk. III" door chime

Greenwood's & Airvac "Mechavent 75" fan ventilator shown in a typical kitchen setting



the necessity for earthing. The manufacturers claim that it can be used with absolute safety out of doors, even in damp conditions—an important point in view of the ever-increasing number of outdoor and gardening attachments being introduced.

S. N. Bridges & Co. offer a wide range of attachments for the home workshop and garden use with their ¼in and ½in "Neonic" drills. The company's latest "de luxe" "Neonic" drill is fitted with an automatic overload cut-out which warns the user that overloading is taking place. The cut-out can be re-set in a matter of seconds. This model includes a ½in "Jacobs" chuck, which has a detachable chromium plated chuck guard. Also there is greater usable power from the new gear ratio giving 2,500 r.p.m. The model is obtainable in six colours—red, green, blue, grey, orange and olive—and is priced at £10 7s 6d. A number of interchangeable accessories which can be converted into lathe, drill stand, bench saw and bench sander, are incorporated in the Bridges "Home Workshop," while in the company's "Decorator" set, a recently introduced accessory, is everything the home decorator needs.

A newcomer to the portable power tool field is the Revo Electric Co., Ltd., who earlier this year introduced their "Revo Jobber." The tool has a drilling capacity of ½in (steel) or ¾in (hard-wood) and the chuck speeds are 2,300 r.p.m. (fully loaded) and 3,300 r.p.m. (no load). The motor, rated at 350 W, is controlled by a robust d.p. switch, which can be locked in the "on" position. It is finished in fawn/grey stoved enamel and its design is such that it fits comfortably in the hand, thus reducing fatigue in operation. The price is £8 18s 6d and, in addition, the company offers seventeen accessory packs. These include a lathe, drill stand, bench saw, bench sander and baseboard.

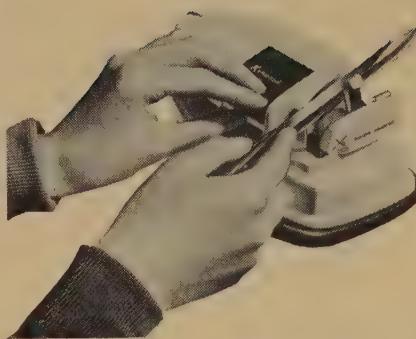
Power-operated tools for the garden are produced by the Tarpen Engineering Co., Ltd. Their most popular

appliance is probably the "Tarpen Trimmer" electric hedge cutter, but, in addition to this, the company's range includes electrically operated grass cutters, a hoe-tiller and portable chain saws. Another product is a pruning saw, a miniature electric chain saw weighing only  $8\frac{1}{2}$  lb, yet with a cutting capacity of up to 5in.

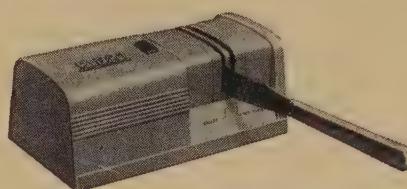
Many other garden tasks can be made easier with the aid of electricity and electrically operated lawn mowers are still gaining in popularity. The two standard 12in and 14in electric mowers manufactured by H. C. Webb & Co., Ltd., remain unaltered in design but the company have introduced a new battery driven model. It is a 14in lawn mower and is believed to be the first of its kind to be marketed as a commercial proposition. It is operated from a 12 V 45 Ah battery and the machine is fitted with a master switch and plug sockets for charging, which can be done *in situ* overnight. The propulsion motor, capable of up to  $\frac{1}{2}$  h.p., is totally enclosed. A single charge provides from two to three hours' use under normal conditions and, because of its light load, the battery life is considerably in excess of the usual guaranteed two years. The total weight of the mower, with battery, is 146 lb and the price of the machine, complete with battery, grass box, and tools, is just under £60.

The enthusiastic gardener can find several other uses for electricity, not the least of which is its application to soil warming. A number of companies produce soil heating units, which usually take the form of a length of heating cable (approximately 120-150ft), which can be arranged to maintain a soil temperature of about 60°F. One unit may cover an area of anything up to 50 sq ft. For the greenhouse several manufacturers produce electric heaters of all types, including

Webb 14in battery driven lawnmower



Kenwood knife and scissors sharpener



Pifco electrically operated knife sharpener

water-filled models when extra humidity may be desirable. To complete the list of electrically operated handyman aids, mention may be made of electric paint scrapers, spray guns and spraying equipment, soldering irons, etc.

An electrically operated knife sharpener has been introduced by Pifco, Ltd. The makers claim that it will deal with all kinds of knives and even scissors. The price is 6 gns. As far as we are aware, the only other electrically operated knife sharpener is that which is still being successfully marketed by Kenwood Manufacturing (Woking), Ltd. This model has now been available almost three years.

Another electrical idea from Pifco is a foot massager, designed to ease the pain and pressure of tired and aching



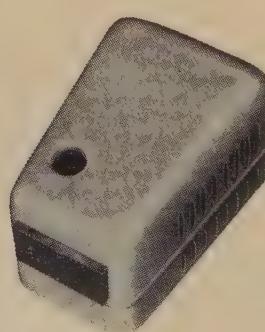
Rudson Wood & Co.'s "Easishine" electric shoe polisher

feet and to stimulate the leg-weary. It is an additional line to the Pifco range of remedial appliances which includes vibratory massagers and infra-red and ultra-violet lamps.

A vibratory massage cushion, the "Viki," is yet another aid to the weary. This appliance, which is being imported by the Rustone Trading Co., Ltd., consists of a plastic cased cushion measuring 14in by 11in, which contains an electric vibrating unit. It can be used to sit on, as a foot rest, or placed in the small of the back and its rapid vibrations are said to stimulate the blood flow. It is priced at £10.

An electrical domestic appliance that is claimed to rid the home of flies, moths and other insects is produced by the Tack Organisation. Known as the "Saxane" fly and moth killer, it consists of a moulded black polished plastic container approximately 6in high by  $3\frac{1}{2}$ in in diameter. The electricity consumption is only 10 W, as only sufficient heat is required to vaporise a special tablet in the top of the apparatus. After a few hours' use in a room, a microscopic film, highly toxic to insects, is deposited on all surfaces, which remains effective for two or three weeks at a time. The "Aerovap" unit, marketed by Shepherd's Aerosols, Ltd., contains a cup of insecticide which, by heat volatilisation becomes an aerosol and provides control of all types of insect pests. Both of these appliances are harmless to human beings and animals and do not contaminate food, whether exposed or otherwise.

Most electrically heated hand dryers are of the heavy commercial type and are not usually considered domestic appliances. Metway Electrical Industries, however, have just produced a hand dryer priced at less than £9, which is intended to cater for the smaller user. Known as the "Dryway" automatic dryer, it is fitted with a 700 W heater and operation is by the



Metway "Dryway" automatic hand dryer

pressing of a button. The warmed air, blown by a fan, dries the hands in approximately 45 seconds and the appliance automatically switches off in 50 seconds. The finish is in white enamel and it is suitable for wall mounting.

There are, of course, several other useful electrical accessories that, in

their own small way, play an important part in home management. These include babies' bottle warmers, devices for warning parents of crying babies, electric trousers creasers, sewing machine motors, hair clippers, etc.—but space is not available to review them all. We might, however, mention the latest addition to this list, the

"Easishine" electric shoe polisher, which has recently been placed on the market by Rudson, Wood & Co., Ltd. A small hand-held appliance, driven by an electric motor, it is provided with two interchangeable brushes, a polishing pad and two tubes of shoe cream, at an inclusive price of £5 17s 6d.

## DOMESTIC APPLIANCES AND THEIR MAKERS

*Full Names and Addresses are given on Pages 44-48*

**Air Conditioners:**—Biddle, Fenton Byrn, G.E.C., Industrial Humidifiers, Lec, Lightfoot, Tack, Temperature, Walter, Westool.

**Baby Alarms:**—Cass, Easco, G.E.C., Hifi, Lee Products.

**Battery Chargers:**—Banner, Crypton, Easco, G.E.C., Heayberd, I.R.L., Partridge Wilson, Philips, Runbaken, Standard Telephones.

**Bells:**—Agro, British General Mfg. Co., Falk, Stadelmann, Friedland, G.E.C., Gent, Julius Sax, Ward & Goldstone.

**Bellpushes, Illuminated:**—Falk, Stadelmann, Friedland, Telsen.

**Blankets and Pads:**—Ajac, Baldwin, Berry's, Best, Bestfrend, Bianella, Bridges, Bulpitt, Chalfont, E. K. Cole, Creators, Denhams, Early, Easipower, Electric Bedwarmers, Electro-Medical, Electro-Warm, Engel, French, Goblin, Gramophone Co., Griffin, Holt Engineering, Robt Holt, Hope, Hurseal, Isopad, Marshall, Milliwatt, Monogram, Morphy-Richards, Mossley, Permaheat, Philips, Pifco, Servitor, "Sleep Content," Stanley, Sutcliffe & Clarkson, Thermalux, Thermega, Thermolectrics, Thermoset, Warmabed, Warmalux, Warmex, Warranty, Windak, Wye Valley Hand Weavers.

**Boiling Plates and Rings:**—Backer, Belling, Bescol, Carron, Davidson, Dexray, Electroway, Engel, English Electric, Gatehill, G.E.C., Grubb, Hotpoint, Metway, Pifco, Price, Reelek, Revo, Telsen.

**Carpet Underlays, Heated:**—Davill, Electro-felts, Isopad, Marpat, Martindill, Milliwatt, Thermalay.

**Churns, Butter:**—Blow, Brent.

**Clocks:**—Anglo Time, Baume, Cass & Phillip, Derby Alabaster, G.E.C., Gent, McKellen (battery), Metamec, Ries, Smiths, Westclox.

**Coffee Mills:**—Brattel, Hillman, Insley, Rudson Wood, Sew-Tric.

**Coffee Percolators:**—Best Products, Bulpitt, Cona, Davidson, Elga, Falk, Stadelmann, G.E.C., Hotpoint, Lincass, Pearl, Reelek, Russell Hobbs, S.L.R., Tomlinson.

**Convector Heaters:**—A.E.I. (Woolwich), Argosy, Belling, Berry's Electric, Bescol, Carron, Century, E. K. Cole, Crosslands (Rugeley), Dexray, Dryden, Dulrae, Electroway, Falk, Stadelmann, Falkirk Iron, Flatley, Frost, Gayfield White, G.E.C., Hawkins, Heatovent, Heatrae, Herga, Hobourn, Hounslow ("Chalex"), Lossos, Midland Electric Mfg., Mitchell, Morphy-Richards, Permoid, Radiation, Reelek, Revo, Simplex, Sofono, Thermaire, Thermoduct, Unity, Wardle, Warmex, Welmec.

**Cookers:**—Allied Ironfounders, Belling, Carron, Edmundsons, English Electric, English Rose, G.E.C., General Steel Wares (McClary-Easy), Moffats, Radiation, Revo, Simplex ("Creda"), Tricity.

**Cookers, Breakfast:**—Belling, Carron, Dexray, G.E.C., Hawkins, Hounslow ("Chalex"), Metway, Radiation, Revo, Telsen, Tricity.

**Cookers, Pressure:**—Hawkins, National Pressure Cooker Co., Prestige.

**Darners, Illuminated:**—Pifco.  
**Dish Washing Machines:**—Acme, Ada, Bulpitt, Colston, Dishlex, Easiclene, Edmundsons, Hobart, Kenwood.

**Door Chimes:**—Friedland, Morphy-Richards, Telsen.

**Drying Cabinets:**—Aerialite, Ardleigh, Baldwin, Belling, Burco, Chalfont, Clifford Products, Cotto, Coventry Radiator, Creators, Davidson, Dorman & Smith, Drial, Dri-Klo, Dryden, Electrix, Electro Driers, Elmair, Elliott, Fenton Byrn, Flatley, Glover, Goblin, Heatovent, Hotpoint, Hounslow ("Chalex"), Inferation, Lamb Hingley, Metway, Modern Equipment, Permaheat, Priwell, Rochdale Sheet Metal, Taylor & Wilson, Treforest, Victor, Woodmet.

**Egg Boilers:**—Hawkins.

**Fan Heaters:**—Aerex, Biddle, Brattel, Bridges, Carnscot Engineers, E. K. Cole, Colt, Engelhard Hanovia, Fenton Byrn, Frost, G.E.C., Gramophone Co., Hi-Fi, Heatovent, Kenwood, Key Leather, Lossos, Midland Electric Mfg., Mitchell, Morphy-Richards, Ormond, Ozonair, Parkinson Cowan, Philips, Phoenix, Pifco, Rippingtons, Spiral Tube, Tack, Thermoduct, Truvox, Unity, Wynbourne.

**Fans:**—Aerex, Aircscrew, Biddle, Colt, Engel, E.R. Co., Falk, Stadelmann, Fenton Byrn, Frost, G.E.C., Greenwood's, Hillman, Hogan & Wardrop, Jones & Stevens, Keith Blackman, Limit, Metway, Miller, Ozonair, Reelek, Revo, Tack, Vent-Axia.

**Feeding Bottle Heaters (Babies):**—Bonni-babe, Brent, Griffin, Williams.

**Fire Lighters:**—G.E.C., Hockley, Lupus.

**Fires:**—Artic Fuse, Belling, Berry's Electric, Bulpitt, Carron, E. K. Cole, C.W.S., Cranmer & Cheshire, Crosslands (Rugeley), Davidson, Dexray, Dimplex, Electroway, Falk, Stadelmann, Falkirk Iron, Ferranti, Formo, Frost, Gatehill, G.B.M., G.E.C., Grubb, Hawkins, Heatrae, Hotpoint, Hounslow ("Chalex"), Lesser, Lonor, Marsden & Bateson, Metway, Midland Electric Mfg., Morley, Morphy-Richards, Nico, Pifco, P. & R. Electrical, Price, Reelek, Revo, Simplex ("Creda"), Sofono, Sperry, Telsen, Willet & Robinson, Woodmet.

**Floor Polishers:**—Bridges, Bylock, Columbus-Dixon, Dowding & Plummer, Electrix, Electrolux, Electrona, G.E.C., Hoover, Ladybird, Phoenix, Tellus, Tricity, Truvox, Vactric.

**Floor Warming Equipment:**—Aerialite, British Insulated Callender's, Calidec, Dulrae, Pyrotex, Simplex, Thermodare, Thermoduct, Tyrad, Wandleside.

**Food Mixers, see Mixers, Food and Drink.**  
**Food Trolleys:**—Blackburn, Hawkins, Kaymet, Bertram Thomas.

**Foot Muffs, Heated:**—Edmundsons, Milliwatt.

**Fountains:**—Stokes, Marlene.  
**Frying Pans:**—National Pressure Cooker, Rogerson Page, Sunbeam.

**Gaslighters:**—Ever Ready, Horstmann, Pifco, Truvox, Vidor.

**Greenhouse Heaters:**—Berry's Electric, Calidec, E. K. Cole, Fenton Byrn, G.E.C., Heatovent, Heatrae, Hursel, Industrial Humidifiers, Reploy, Roberts Electrical, Santon, Bertram Thomas, Unity, Wardle.

**Grills, Infra-Red:**—Brattel, Engel, Infra-Heat, Magicook, Modern Equipment, Standard Sales ("Cadillac"), Warner, Wexen.

**Grinders, Coffee:**—Brattel, Hillman, Sew-Tric.

**Hair Clippers:**—Chilton, Fransen, Pifco.

**Hair Dryers:**—Bestfrend, Bridges, Brown Bros, Bylock, C.W.S., Edmundsons, Electrothermal, Falk, Stadelmann, Fransen, G.E.C., Hawkins, Hillman, Morphy-Richards, Ormond, Pifco, Reelek, Siroma, Southern Airframe.

**Heat Pump:**—English Rose Kitchens.

**Heaters, Infra-red:**—E. K. Cole, Dimplex, Falk, Stadelmann, Gatehill, G.B.M., Gordon-Miller, Grafton, Grimwood, Hanovia, Metway, P. & R. Electrical, Tack, Thermodare.

**Heating Panels:**—E. K. Cole, Dexray, Dulrae, Electrothermal, G.E.C., Heatovent, Herga, Isopad, Morheat, Tyrad, Unity.

**Hedge Trimmers:**—Black & Decker, Bridges, Bylock, Tarpen, Wolf.

**Immersion Heaters:**—Aidas ("Sadia"), Berry's Electric, Blackburn, Geo. Bray, Bulpitt, Controlled Heating Units (London), Eltron, Falk, Stadelmann, G.B.M., G.E.C., Grubb, Heatrae, Hotpoint, Duncan Low, Metway, Mitchell, Morley, George Nobbs, Remploy, Santon, Simplex ("Creda"), Sperry.

**Insect Killers:**—Shepherd's Aerosols, Tack, Vulcan.

**Ironers:**—Ada, English Electric, G.E.C., Hotpoint, Morphy-Richards, Radiation, Revo, Silical Water Softeners, Wilkins & Mitchell.

**Irons, Automatic:**—Bylock, C.W.S., Easipower, Edmundsons, Falk, Stadelmann, Gatehill, G.E.C., Gramophone Co., Hawkins, Homefyre, Hotpoint, Jelson, Lincass, Metway, Morphy-Richards, Pifco, Revo, Robson, Scottish Precision, Telsen.

**Irons, Non-Automatic:**—Brown Bros., Carron, C.W.S., Falk, Stadelmann, G.E.C., Homefyre, Lincass, Metway, Robson, Scottish Precision, Selex, Sims, Telsen.

**Irons, Cordless:**—Donaldson, Walter.

**Irons, Steam or Dry:**—Best, Edmundsons, Hoover, Morphy-Richards.

**Irons, Travelling:**—Elga, Falk, Stadelmann, G.E.C., Metway, Morphy-Richards, Robson, Sims, Telsen.

**Jugs, Electric:**—Bulpitt, Hawkins.

**Kettles:**—Bescol, Best Products, Bulpitt, Buncher & Haseler, Chalfont, C.W.S., Dependable Products, Doughty, Easipower, Elga, Eltron, Fordham Pressings, G.E.C., Hawkins, Hotpoint, Lincass, Metway, Midland Metal, Mirroware, Pearl, Pifco, Reelek, Revo, Russell Hobbs, Stevens, Telsen, Tomlinson.

**Kettles, Whistling:**—Best Products, Bulpitt, Fordham Pressings.

**Knife Sharpeners:**—Kenwood, Pifco.

**Lawnmowers:**—Alpha (attachment), J.P., Ladybird, Nutt ("Hayn"), Shanks, Webb.

**Lighting Fittings:**—A.E.I. Lamp & Lighting, Allom, Alsopp & Booth, Arctic Fuse, Ascog, Atlas Lighting, Benjamin, Berry's, Best & Lloyd, Bristol, British General, Chrysoline, Cone Fittings, C.W.S., Cranmer & Cheshire, Crosslands (Rugeley), Derby Alabaster, Dernier & Hamlyn, Dexray, Downer, Duncan, Partners & Price, Ekco-Ensign, Electric Art Shade, Ever Ready, Falcon Forge, Falk, Stadelmann, Fancy Metal Goods, Finmar, Forrest, G.B.M., G.E.C., Oswald Hollman, Homeshade, Hume Atkins, Kego, Kirolite, Knightshades, Linealex, Linolite, Loblite, Logan, Maclamp, McGeoch, Merchant Adventurers, Metway, Morley, New Estate, Nico, Osborn ("Cobra"), Osler & Faraday, Payne & Penny, Philament, Philips, Pifco, Preston, Purdy & Cadman, Quinnett, Rotaflex, Rowlands, Schulman, Selex, Simplus, Herman Smith Smithlite, Speights, Spencer Metalcraft, Straight-Lite Reflectors, Telsen, Fredk. Thomas, Troughton & Young, Twentieth Century, Ward & Goldstone, Wardle, Webb's Crystal Glass, Wholesale Fittings, Wraith, Wright.

**Massagers:**—London Commercial Electrical Stores, Pifco.

**Mats, Heated:**—Broadway Supplies, Edmundsons.

**Mattresses, Heated:**—Slumberland, Therma-lux.

**Medical Lamps:**—Barber, Chalfont, Electro-Medical, Engel, Hanovia, Hope, London Commercial Electrical Stores, Lumsden, Metway, Perihel, Philips, Pifco, Raysol, Watson.

**Mixers, Food and Drink:**—Berry's Electric, Brattel, Bridges, Bylock, Brown Bros., Crittall-Aquafont, Edmundsons, English Electric, Falk, Stadelmann, Hillman, Kenwood, Midland Repetition, Morphy-Richards, National Pressure Cooker Co., Philips, Rudson Wood, Siroma, Sunbeam, Valmade, Warner.

**Ozonisers:**—Aero Pipe & Glass, E.C.D., Ozonair, Walter.

**Paint Strippers:**—Baronet, Horvell, Metway, Osborn, Pifco, Skarsten.

**Plate Warmers:**—Belling, Edmundsons, Engel, English Electric, G.E.C., Heatrae, Hotpoint, Kaymet, Revo, Telsen, Bertram Thomas, Tricity.

**Radiators, Low Temperature:**—Berry's, Crompton Parkinson, Dimplex, Dryden, Hera, Unity, Warmex.

**Radiators, Water and Oil Filled:**—Crompton Parkinson, Dimplex, Drydenair, G.B.M., Grubb, Hobourn, Hursell, Industrial Humidifiers, Duncan Low, MacKey Bowley, Remploy, Santon, Steel Radiators.

**Refrigerators:**—Ada, Baldwin, Bauknecht, Bendix, Bosch, Bylock, Collette, Crowther, Denham & Morley, Easiclene, Edmundsons, Electrix, Electrolux, Elliott, English Electric, English Rose, Flatley, Frigidaire, G.E.C., General Steel Wares, Gramophone Co., Harper, Hotpoint, Indes, Kelvinator, Kenwood, Leat, Lec Refrigeration, Lightfoot, Lonor, Main, Merseyside Engineering, Morphy-Richards, Pakamac, Pressed Steel, Radiation, Simplex, Tedelex, Tricity, Welmech, Wilec.

**Refuse Disposal Units, Sink:**—Haigh, David Jackson, Kenwood, Sissons, Wynbourne.

**Sewing Machine Motors:**—Carter, G.E.C., Hillman, London Commercial Electrical Stores, Parvalux, Sew-Tric.

**Shavers:**—Chilton, Ever Ready Co. (G.B.), Ever Ready Razor Products, Fransen, Lonor, Perihel, Philips, Pifco, Remington, Ries, Rolls, Ronson, Schick, Sunbeam, Welmech.

**Shaving Mirrors, Illuminated:**—Coalport, Pifco.

**Shoe Polishers:**—Rudson Wood.

**Soil-Heating Equipment:**—Ajac, Banner, Calidec, Chalfont, Electrothermal, G.E.C., Roberts Electrical Unity.

**Soldering Irons:**—Acrus, Adcola, A.E.I. (Woolwich), Browning's Electric, G.E.C., Kempner, Light Soldering Developments, Pifco, Rawlplug, Remploy, Runbaken, Standard Telephones, Telsen, Wolf.

**Spin Dryers:**—Acme, Ada, Aerialite, Best, Bylock, Chilton, Denham & Morley, Drymaster, Easiclene, Elliott, Fisher & Ludlow, Frigidaire, Goblin, Gordon-Miller, Gramophone Co., Hoover, Kenwell, Kenwood, Lonor, Main, Morphy-Richards, Nutt Engineering, Parkinson, Philips, Radiation, Simplex, Summerscales, Tedelex, Thermair, Welmech (A.E.G.), Wilkins & Mitchell, Wynbourne.

**Spits, Roasting:**—Brattel, Infra-Heat, Kenwood, Standard Sales ("Cadillac"), Warner.

**Sprayers:**—Burgess, Bylock.

**Tea Makers:**—Darragh, Smail, Goblin, Hawkins, Pifco, Teesmade.

**Toasters, Automatic:**—Dualit, Elga, Falk, Stadelmann, Morphy-Richards, Pifco.

**Toasters, Non-Automatic:**—Bulpitt, Dualit, Easipower, G.E.C., Hawkins, Homefyre, Hotpoint, I.R.L., Lincass, Metway, New Forest Services, Ormond, Price, Reelek, Telsen.

**Tools, Portable:**—Black & Decker, Bridges, Electrix, Rawlplug, Revo, Selecta, Tarpen, Wolf.

**Towel Rails:**—Belling, Dimplex, Dryden, Dulrae, G.B.M., Heatrae, Hursell, Lan-Bar.

**Trousers Creasers:**—Falk, Stadelmann, Lighters, Pifco.

**Tubular Heaters:**—Bescol, Calidec, E. K. Cole, Electroway, Falk, Stadelmann, G.E.C., Grubb, Heatovent, Heatrae, Remploy, Roberts Electrical, Unity, Wardle.

**Tumbler Dryers:**—Acme, Beatty, Burco, English Electric, Radiation.

**Utensils, Ground Base:**—Bulpitt, Buncher & Haseler, Corfield-Sigg, Easipower, G.E.C., Hague & McKenzie, Midland Metal Spinning, Mirroware, Pearl, Stevens, White Bros. & Jacobs.

**Vacuum Cleaners, Canister:**—Bylock, Goblin, Hoover, Morphy-Richards, Radiation, Tellus.

**Vacuum Cleaners, Cylinder:**—Brown Bros., Bylock, Cadisch, C.W.S., Dowding & Plummer, Edmundsons, Electrix, Electrolux, Express, G.E.C., Goblin, Hogan & Wardrop, Hoover, Lonor, Phoenix, Reelek, Siroma, Taylor, Vactric, Wholesale Fittings.

**Vacuum Cleaners, Hand:**—Brown Bros., Bylock, Cadisch, C.W.S., Dowding & Plummer, Edmundsons, Falk, Stadelmann, Genwind, Hoover, Pifco, Reelek, Rudson Wood, Simplus, Siroma, Tarpen, Taylor, Vactric, Water Softener & Vacuum Cleaner Service, Wholesale Fittings Co.

**Vacuum Cleaners, Upright:**—Brown Bros., Cadisch, Columbus-Dixon, C.W.S., Edmundsons, G.E.C., Glenhouse, Goblin, Hogan & Wardrop, Hoover, Hotpoint, Lonor, Nash, Reelek, Siroma, Taylor, Tedelex, Vactric, Wholesale Fittings.

**Waffle Irons:**—Dualit, Infra-Heat, S.L.R.

**Washboilers:**—Bradley, Brunlec, Bulpitt, Burco, Chalfont, Cotto, C.W.S., Darlaston, Dugdale, Easiclene, G.E.C., Hawkins, Lamb Hingley, Main, Mastermet, Mirroware, Monarch, Northern Industries, Radiation, Simister, Herman Smith Smithlite, Taylor & Wilson, Tomlinson, Treforest.

**Washing Machines:**—Acme, Ada, Beatty, Bendix, Brunlec, Burco, Bylock, Clegg & Coupe, Cotto, C.W.S., Denham & Morley, Easiclene, Edmundsons, English Electric, Flatley, Frost, G.E.C., Goblin, Hoover, Hotpoint, Kenwell, Layford, Longford Electric, Merseyside Eng., Plieger, Radiation, Rolls, Senior, Summerscales, Universal Boilers, Vactric, Welmech (A.E.G.), Wilkins & Mitchell, Wynbourne.

**Water Heaters, Instantaneous:**—Grimwood, I.C.G. ("Clage"), Plow.

**Water Heaters, Storage:**—Aidas ("Sadia"), Berry's Electric, Eltron, G.E.C., Heatrae, Main, Modern Equipment, Radiation, Santon, Simplex ("Creda"), W. H. Smith ("Ezio").

## Names and Addresses of Firms Referred to in this Issue

**Acme Domestic Equipment, Ltd.**, David Street, Glasgow, S.E.

**Acrus Electric Tool Mfg. Co., Ltd.**, Demmings Road, Cheadle, Cheshire.

**Ada (Halifax), Ltd.**, Johnson Street, Halifax.

**Adcola Products, Ltd.**, Gauden Road, Clapham High Street, London, S.W.4.

**A.E.I.-Hotpoint, Ltd.**, 33, Grosvenor Place, London, S.W.1.

**A.E.I. Lamp & Lighting Co., Ltd.**, Melton Road, Leicester.

**A.E.I. (Woolwich), Ltd.**, Woolwich, London, S.E.18.

**Arex, Ltd.**, 6-7, New Bridge Street, London, E.C.4.

**Aerialite, Ltd.**, Congleton, Cheshire.

**Aero Pipe & Glass Co., Ltd.**, Harlesden Road, London, N.W.10.

**Agro Electrical Co., Ltd.**, 60-66, Wardour Street, London, W.1.

**Aidas Electric, Ltd.**, Sadia Works, Rowdell Road, Northolt, Greenford, Middlesex.

**Airscrew Co. & Jicwood, Ltd.**, Weybridge.

**Ajac Electrical Products, Ltd.**, Morley Road, Llandudno.

**Allied Ironfounders, Ltd.**, 28, Brook Street, London, W.1.

**Allom Heffer & Co., Ltd.**, 17, Montpelier Street, London, S.W.7.

**Alsopp & Booth, Ltd.**, Dudley Port, Tipton.

**Alpha Machine (Tools), Ltd.**, Avenue Works, Gidea Park, Essex.

**Anglo Time Corporation, Ltd.**, 19, Hatton Garden, London, E.C.1.

**Ardleigh Spraying Co., Ltd.**, Ardleigh, Colchester.

**Argosy Engineering, Ltd.**, Hertford Road, Barking, Essex.

**Artic Fuse & Electrical Eng. Co., Ltd.**, Birtley, Co. Durham.

**Ascog, Ltd.**, 44, Theobald's Road, London, W.C.1.

**Associated Electrical Industries (Woolwich), Ltd.**, Woolwich, London, S.E.18.

**Atlas Lighting, Ltd.**, Thorn House, Upper St. Martins Lane, London, W.C.2.

**Auto-Doors**, 90, Shaw Road, Thornham, Rochdale.

**Backer Electric Co., Ltd.**, Fitzwilliam Road, Rotherham.

**Balcombe, A. J., Ltd.**, 52-58, Tabernacle Street, London, E.C.2.

**Baldwin, H. J., & Co., Ltd.**, 132, Arkwright Street, Nottingham.

**Banner Electric Co., Ltd.**, Burford House, Hoddesdon, Herts.

**Barber Electrical Services**, Weston Airport, Weston-super-Mare, Somerset.

**aronet Electrical Developments**, Ltd., Alston Street, Ladywood, Birmingham, 16.  
**auknecht (G.B.)**, Ltd., 1-9, Dover Yard, London, W.I.  
**Baume & Co.**, Ltd., Dunstan House, St. Cross Street, London, W.C.1.  
**Beatty Bros. (Tenbury)**, Ltd., 25, Davyhulme Road East, Stretford, Manchester.  
**Belling & Co.**, Ltd., Bridge Works, Southbury Road, Enfield.  
**Gendix Home Appliances**, Ltd., Albion Works, Kingsbury Road, Birmingham, 24.  
**Benjamin Electric**, Ltd., Brantwood Works, Tariff Road, London, N.17.  
**Berry's Electric**, Ltd., Touchbutton House, Newman Street, London, W.I.  
**Eescal (Electric)**, Ltd., 118, Parkfield Road, Saltley, Birmingham, 8.  
**Best & Lloyd**, Ltd., Waterville Road, Birmingham, 21.  
**Best Products**, Ltd., Felix Works, Felixstowe.  
**Bestfrend Electrical Co.**, Ltd., Diceland Works, Banstead, Surrey.  
**Siddle, F. H.**, Ltd., 16, Upper Grosvenor Street, London, W.I.  
**Black & Decker**, Ltd., Harmondsworth, Middlesex.  
**Blackburn, C. H., & Co.**, Ltd., 10, Gray's Inn Road, London, W.C.1.  
**Glenna**, Ltd., Boston Spa, Yorkshire.  
**Slow, J. J.**, Ltd., Oldfield Works, Chesterfield.  
**Cinnibabe Products**, 14-16, Philpot Lane, London, E.C.3.  
**Gosch**, Ltd., 20, Carlisle Road, London, N.W.9.  
**Gowen, John, Fittings**, Ltd., 556-586, Kings Road, Chelsea, S.W.  
**Bradley & Co.**, Ltd., Albion Works, Mount Pleasant, Biston, Staffs.  
**Strattel Electric Co.**, Ltd., 1-9, Dover Yard, London, W.I.  
**Gray, Geo., & Co.**, Ltd., Leicester Place, Leeds, 2.  
**Grent (Hailsham)**, Ltd., Station Road, Hailsham, Sussex.  
**Bridges, S. N., & Co.**, Ltd., York Road, London, S.W.11.  
**Bristol, Chas. F., & Son**, Ltd., 17-19, Lench Street, Birmingham, 4.  
**British General Mfg. Co. (1941)**, Ltd., 38, Glasshill Street, London, S.E.1.  
**British Insulated Callender's Cables**, Ltd., 21, Bloomsbury Street, London, W.C.1.  
**Broadway Supplies**, Ltd., 33, Great Titchfield Street, London, W.I.  
**Brown Brothers**, Ltd., Great Eastern Street, London, E.C.2.  
**Browning's Electric Co.**, Ltd., Boleyn Castle, Green Street, Upton Park, London, E.13.  
**Brunlee Appliances**, Ltd., Junction Street, Burnley, Lancs.  
**Bulpitt & Sons**, Ltd., Icknield Street, Birmingham, 18.  
**Buncher & Haseler**, Ltd., Branston Street, Birmingham, 18.  
**Burco**, Ltd., Waterside Mill, Rose Grove, Burnley.  
**Burgess Products Co.**, Ltd., Hinckley, Leicester.  
**Sylock Electric**, Ltd., 109, South Street, Enfield, Middx.  
**Cadisch, R., & Sons**, 38-46, Orsman Road, London, N.1.  
**Calidec**, Ltd., Station Approach, Solihull, Warwickshire.  
**Carnscot Engineers**, Ltd., Carntyne Industrial Estate, Glasgow, E.2.  
**Carron Company**, Carron, Falkirk.  
**Carter Electrical Co.**, Ltd., Eastern Works, Eastern Avenue, Romford.  
**Cass & Phillip**, Ltd., Mark Road, Adeyfield, Hemel Hempstead.  
**Cass Electronics**, Ltd., Guildford Street, Chertsey.  
**Century Convector**, Ltd., Waterloo Road, Clitheroe, Lancs.  
**Chalfont Electrical Products**, Ltd., Tyrrell Street, Leicester.  
**Chilton Electric Products**, Ltd., Hungerford, Berks.  
**W.S. Chrysaline**, Ltd., 282, High Street, Berkhamsted, Herts.  
**Clegg & Coupe**, Ltd., Molesworth Street, Rochdale.  
**Clifford Products**, Ltd., Friar Street, Reading, Berks.  
**Coalport Metalware**, Ltd., Coalport, Ironbridge, Shropshire.  
**Collette Refrigeration**, 11, Dafforne Road, London, S.W.17.  
**Cole, E. K.**, Ltd., Ekco Works, Southend-on-Sea.  
**Colston, Charles**, Ltd., 7-11, Lexington Street, London, W.I.  
**Colt Ventilation**, Ltd., 15, Langley Road, Surbiton, Surrey.  
**Columbus-Dixon**, Ltd., Capitol Works, Empire Way, Wembley, Middlesex.  
**Cona Coffee Machine Co.**, Feldon Works, Railway Place, Wimbledon, London, S.W.19.  
**Cone Fittings**, Ltd., 9, Rosemont Road, London, N.W.3.  
**Controlled Heating Units (London)**, Ltd., Avenue Road, Hampton, Middlesex.  
**Co-operative Wholesale Society**, National Works, Hall Street, Dudley, Worcs.  
**Corfield-Sigg**, Ltd., Trafalgar Works, Merton Abbey, London, S.W.19.  
**Cotto Products**, Ltd., Enterprise Works, Scunthorpe.  
**Coventry Radiator & Presswork Co.**, Ltd., Canley Works, Coventry.  
**Cradley Foundry & Engineering Co.**, Maypole Fields, Cradley, Staffs.  
**Crammer & Cheshire**, Ltd., 7-9, Steward Street, Birmingham, 18.  
**Creators**, Ltd., Plansel Works, Sheerwater, Woking.  
**Crittall-Aquafont Group**, Ltd., Trojan Works, Kentish Town Road, London, N.W.1.  
**Crompton Parkinson**, Ltd., Crompton House, Aldwych, W.C.2.  
**Crosslands (Rugeley)**, Ltd., 55, Ebury Street, London, S.W.1.  
**Crowthorn Engineering Co.**, Ltd., Atlas Works, Reddish, Stockport.  
**Crypton Equipment**, Ltd., Bridgwater.  
**Darlaston Galvanised Holloware Co.**, Ltd., Wednesbury, Staffs.  
**Darragh, Smail & Co.**, Ltd., 41, Queen Street, London, E.C.4.  
**Davidson, A. D.**, Electric Co., 62, Granville Street, Birmingham, 1.  
**Davill Manufacturing Co.**, Ltd., 22, Elliston Avenue, Birmingham, 22a.  
**Denham & Morley**, Ltd., 173-175, Cleveland Street, London, W.I.  
**Denhams (Norwich)**, Ltd., St. George's Works, All Saints Road, Acton, London, W.3.  
**Derby Alabaster (Art Products) Co.**, Shardlow Manor, London Road, Shardlow, Derby.  
**Dernier & Hamlyn**, Ltd., 23, Newman Street, London, W.I.  
**Dexray Engineering Co.**, Ltd., 34, Ardwick Green South, Manchester, 13.  
**Dimplex**, Ltd., Millbrook, Southampton.  
**Dishlex (Great Britain)**, Ltd., 22, Golden Square, London, W.I.  
**Donaldson Wireless Electric Irons**, 31, Sloane Street, Leith, Edinburgh, 6.  
**Doughty, J. M., & Sons**, Ltd., 214-222, St. John's Street, London, E.C.1.  
**Dowding & Plummer**, Ltd., 2, Jakeman Walk, Birmingham, 12.  
**Downer, G. V.**, 29b, Torrington Square, London, W.C.1.  
**Dowsing Co. (Electrical Manufacturers)**, Ltd., 100, Holdenhurst Road, Bournemouth.  
**Drial Automation**, Ltd., Station Road, Merton Abbey, London, S.W.19.  
**Dri-Klo (Sales)**, Ltd., 157, Wellington Road South, Stockport.  
**Dryden, Thos., & Sons**, Ltd., Drydenair Dept., Grimshaw Street, Preston.  
**Drymaster**, Ltd., 192-196, Kensington Church Street, London, W.8.  
**Dualit**, Ltd., 18-22, Penarth Street, Ilford Road, S.E.15.  
**Dugdale Mfg. Co.**, Craven Sheet Metal Works, Settle, Yorks.  
**Dulrae**, Ltd., Spur Road, Feltham, Middx.  
**Duncan, Partners & Price**, Ltd., 33, Petergate, London, S.W.18.  
**E.C.D.**, Ltd., Priory Mill, Tonbridge.  
**Early, Charles, & Co.**, Witney Mills, Oxfordshire.  
**Easco Electrical**, Ltd., 6-8, Brighton Terrace, London, S.W.9.  
**Easiclene Porcelain Enamel (1938)**, Ltd., Darlaston, South Staffs.  
**Easipower**, Ltd., 30, High Street, Southampton.  
**Edmundsons Electrical Wholesalers**, Ltd., 240-250, Ferndale Road, London, S.W.9.  
**Ekco-Ensign Electric**, Ltd., 45, Essex Street, London, W.C.2.  
**Electric Art Shades (1928)**, Ltd., Feering Factory, Kelvedon, Essex.  
**Electric Bedwarmers**, Ltd., Waterside, Todenham, Lancs.  
**Electrical Division of Radiation**, Ltd., 255, North Circular Road, London, N.W.10.  
**Electrix**, Ltd., Sterling Works, Dagenham.  
**Electro Driers**, Ltd., Bridge Works, Lymm, Cheshire.  
**Electrofelts**, Ltd., 42, North Frederick Street, Glasgow, C.1.  
**Electrolux**, Ltd., 153-155, Regent Street, London, W.1.  
**Electro-Medical Blankets**, Ltd., Nugent Street, Leicester.  
**Electrothermal Engineering**, Ltd., 270, Neville Road, London, E.7.  
**Electro-Warm**, Ltd., Waverley Lodge, Ditchingham, Bungay, Suffolk.  
**Electroway Heaters**, Ltd., Rosebery Street, Loughborough.  
**Elga Products**, Ltd., Lane End, nr. High Wycombe, Bucks.  
**Elliott Domestic Appliances**, Ltd., Elmgrove Road, Harrow, Middx.  
**Elm Works**, Ltd., Summerstown, London, S.W.17.  
**Eltron (London)**, Ltd., Accrington Works, Strathmore Road, Croydon, Surrey.  
**Engel, S. I.**, 23-25, Kensington Park Road, London, W.11.  
**Engelhard-Hanovia**, Ltd., Slough, Bucks.  
**English Electric Co.**, Ltd., Queens House, Kingsway, London, W.C.2.  
**English Rose Kitchens**, Ltd., Wharf Street, Warwick.  
**Entwistle & Kenyon**, Ltd., Accrington.  
**Ever Ready Co. (Great Britain)**, Ltd., Hercules Place, London, N.7.  
**Ever Ready Razor Products**, Ltd., 26-28, Bedford Row, London, W.C.1.  
**Express Vacuum Cleaner Co.**, 96, Bath Street, Birmingham, 4.  
**Falco Electrical Appliances**, Ltd., Corporation Road, Audenshaw, Manchester.  
**Falcon Forge (Props.: Thomas Haywood & Sons)**, Coulsdon, Surrey.  
**Falk, Stadelmann & Co.**, Ltd., 91, Farringdon Road, London, E.C.1.  
**Fancy Metal Goods**, Ltd., Summerhill Road, Birmingham, 1.  
**Fenton Byrn & Co.**, Ltd., Airflow Works, 21, Berrylands Road, Surbiton.  
**Ferranti**, Ltd., Hollinwood, Lancs.  
**Filtrete**, Ltd., 91-97, London Road, Manchester, 1.  
**Fimmar**, Ltd., 26, Kingly Street, London, W.1.  
**Fisher & Ludlow**, Ltd., Kingsbury Road, Birmingham, 24.  
**Flatley, A. J.**, Ltd., Kingston Mill, Cobden Street, Salford, 6.  
**Fordham Pressings**, Ltd., Dudley Road, Wolverhampton.  
**Formo Products**, Ltd., Masons Hill, Bromley, Kent.  
**Forrest, George, & Son**, Ltd., Arundel Road, Industrial Estate, Uxbridge.  
**Fransen, John A.**, Ltd., Northwood Hills, Middlesex.  
**French, Thos., & Sons**, Ltd., Chester Road, Manchester, 15.  
**Friedland, V. & E.**, Ltd., Lower Heys Mills, Macclesfield, Cheshire.  
**Frigidaire, Division of General Motors**, Ltd., Stag Lane, Kingsbury, London, N.W.9.  
**Frost, H., & Co.**, Ltd., Fieldgate, Walsall, Staffs.  
**G.B.M. (Electrical)**, Birmingham, 439, Moseley Road, Birmingham, 12.  
**Gatehill Becc**, Ltd., Kennard Road, London, E.15.  
**Gayfield White**, Ltd., Parion House, Witham, Essex.  
**General Electric Co.**, Ltd., Magnet House, Kingsway, London, W.C.2.  
**General Steel Wares**, Ltd., 259, Marylebone Road, London, N.W.1.  
**Gent & Co.**, Ltd., Faraday Works, Leicester.  
**Glover, J., & Sons**, Ltd., 39-49, Groton Road, London, S.W.18.

**Goblin (B.V.C.), Ltd.**, Goblin Works, Leatherhead, Surrey.

**Gordon-Miller, Ltd.**, 91, Beddington Lane, Croydon, Surrey.

**Gramophone Co., Ltd.**, Hayes, Middx.

**Greenwood's & Aircav Ventilating Co., Ltd.**, Beacon House, Kingsway, London, W.C.2.

**Griffin, David, Ltd.**, 39, Wimborne Road, Poole.

**Grimwood (Croydon), Ltd.**, 59-65, Cross Road, East Croydon.

**Grubb Engineering Co., Ltd.**, Mary Street, Birmingham, 12.

**Grubert of Copenhagen, Ltd.**, 293, Kentish Town Road, London, N.W.5.

**Hague & McKenzie, Ltd.**, Pyramid Works, Sloane Street, Birmingham, 1.

**Haigh Engineering Co., Ltd.**, Ross-on-Wye, Herefordshire.

**Hanovia, Engelhard, Ltd.**, Slough, Bucks.

**Harper, John, & Co., Ltd.**, Albion Works, Willenhall, Staffs.

**Hawkins, L. G., & Co., Ltd.**, 30-35, Drury Lane, London, W.C.2.

**Haywood, Thomas, & Sons (Falcon Forge), Coulson, Surrey.**

**Heatoven Electric, Ltd.**, Lomond Street, Possilpark, Glasgow, N.

**Heatrae, Ltd.**, Heatrae Works, Norwiche.

**Heayberd, F. C., & Co., Ltd.**, Greenwich South Street, London, S.E.10.

**Herga Electric, Ltd.**, Wallingford Road, Uxbridge, Middx.

**Hifi, Ltd.**, Station Road, Old Hill, Staffs.

**Hillman Electric Motors, Ltd.**, Crane Grove, London, N.7.

**Hobart Manufacturing Co., Ltd.**, Hobart Corner, London, N.11.

**Hobourn Domestic Appliances, Ltd.**, Temple Farm Works, Strood, Rochester, Kent.

**Hockley Electric Co., Ltd.**, 56, Great Hampton Street, Birmingham, 18.

**Hogan & Wardrop, Ltd.**, 400, Garratt Lane, London, S.W.18.

**Hollman, Oswald, Ltd.**, 208, Kent House Road, Beckenham, Kent.

**Holt Engg. & Mfg. Co., Ltd.**, Hemco Works, 210, Stockport Road, Manchester, 13.

**Holt, Robert (Middx.), Ltd.**, Florence Road, Edmonton, N.18.

**Homefyre, Ltd.**, 10, Sheendale Road, Richmond, Surrey.

**Homeshade Co., Ltd.**, 99, Baker Street, London, W.1.

**Hoover, Ltd.**, Perivale, Greenford, Middx.

**Hope, David, & Co., Ltd.**, Nugent Street, Leicester.

**Horstmann Gear Co., Ltd.**, Newbridge Works, Bath.

**Horvell Products, Ltd.**, Red House Industrial Estate, Aldridge, Staffs.

**Hotpoint, A.E.I.-**, 33, Grosvenor Place, London, S.W.1.

**Hounslow, C., & Co., Ltd.**, Chalex Works, Southwick, Sussex.

**Hume, Atkins & Co., Ltd.**, New Icknield Way, Letchworth.

**Hurseal, Ltd.**, 229, Regent Street, London, W.1.

**I.C.G., Ltd.**, The Royal Assembly Rooms, Tunbridge Wells, Kent.

**I.R.L. Products, Ltd.**, No. 5 Factory, Upper Bristol Road, Bath.

**Index Refrigeration (G.B.), Ltd.**, 117, Mitcham Lane, London, S.W.16.

**Industrial Humidifiers, Ltd.**, Groveley Road, Christchurch, Hants.

**Inferation, Ltd.**, 12-13, Copthall Court, London, E.C.2.

**Infra-Heat Co., Ltd.**, 22, Clifton Road, London, W.9.

**Insley (London), Ltd.**, 21-22, Poland Street, W.1.

**Isopad, Ltd.**, Barnet By-pass, Boreham Wood, Herts.

**J.P. Engineering Co., Ltd.**, Meynell Road, Leicester.

**Jackson, see Radiation, Ltd.**

**Jackson, David (Engineers), Ltd.**, 11, Mauldeth Road, Manchester, 20.

**Jelson Electric, Ltd.**, Spring Road, Tyseley, Birmingham, 11.

**Jones & Stevens, Ltd.**, Eastern By-pass, Littlemore, Oxford.

**Kaymet Co., Sylvan Grove, London, S.E.15.**

**Kego Electric Co., Ltd.**, Mount Pleasant, Wembley.

**Keith Blackman, Ltd.**, Mill Mead Road, London, N.17.

**Kelvinator, Ltd.**, Hudson Motors Building, Great West Road, London, W.4.

**Kempner, S., Ltd.**, 29, Paddington Street, London, W.1.

**Kenwell Electric, Ltd.**, Meanwood Works, Spotland Bridge, Rochdale.

**Kenwood Manufacturing Co., Ltd.**, Woking, Surrey.

**Key Leather Co., Ltd.**, 5, Urswick Road, London, E.9.

**Kirolite Products, Ltd.**, 107, Southwick Road, Boscombe East, Bournemouth.

**Knightshades, Ltd.**, Theaklen Drive, St. Leonards-on-Sea, Sussex.

**Ladybird Appliances, Ltd.**, Molly Millar's Lane, Wokingham, Berks.

**Lamb, Hingley & Co., Ltd.**, Lye, Stourbridge, Worcs.

**Lan-Bar, Ltd.**, Seymour Street, Birmingham, 12.

**Layford Electrical, Ltd.**, 7, Chesterfield Gardens, London, W.1.

**Leat, F. & T., Ltd.**, Ebberns Road, Hemel Hempstead, Herts.

**Lee Refrigeration, Ltd.**, Shripney Works, Bognor Regis, Sussex.

**Lee Products (G.B.), Ltd.**, 21, Longford Street, London, N.W.1.

**Lesser, David C., & Co., Ltd.**, 510a, Coventry Road, Birmingham, 10.

**Light Soldering Developments, Ltd.**, 28, Sydenham Road, Croydon, Surrey.

**Lighters, Ltd.**, Pioneer House, Inverness Road, Hounslow, Middlesex.

**Lightfoot Refrigeration Co., Ltd.**, Abbeydale Road, North Circular Road, Wembley.

**Limit Engineering Group, Ltd.**, 64, Essex Road, London, N.1.

**Lincass Electric, Ltd.**, Guildford Street, Chertsey, Surrey.

**Lineaux, Ltd.**, 142, Liverpool Road, London, N.1.

**Linolite, Ltd.**, 118, Baker Street, London, W.1.

**Loblite, Ltd.**, Third Avenue, Team Valley Trading Estate, Gateshead-on-Tyne.

**Logan, Walter, & Co., Ltd.**, 34, Oak Tree Drive, London, N.20.

**London Commercial Electrical Stores, Ltd.**, 20-22, Cursitor Street, Chancery Lane, London, E.C.4.

**Longford Electric Co., Ltd.**, 6, Grosvenor Street, Manchester, 1.

**Lonor, Ltd.**, 1, Maddox Street, London, W.1.

**Lossos, M. & J., & Co., Ltd.**, 31, Beethoven Street, London, W.10.

**Low, Duncan, Ltd.**, 57-61, Trossachs Street, Glasgow, N.W.

**Lumsden Lamp Co., Milburn, Almondbank, Perth.**

**Lupus Electrical Products, Ltd.**, Oxford Road, Altrincham, Cheshire.

**McGeoch, Wm., & Co., Ltd.**, 46, Coventry Road, Birmingham.

**McKellen Productions, Ltd.**, Birmingham Road, Bromsgrove, Worcester.

**MacKey Bowley (Steelworkers), Ltd.**, 21, Caledonian Road, London, N.1.

**Maclamp Co., Ltd.**, 56, Church Road, London, W.3.

**Magicook Appliances, Ltd.**, 115/129, Carlton Vale, London, N.W.6.

**Main, R. & A., Ltd.**, 48, Grosvenor Gardens, London, S.W.1.

**Marlene Products (London), Ltd.**, 147, Banner Street, London, E.C.1.

**Marpat Manufacturing, Ltd.**, Hart Street, Walsall, Staffs.

**Marsden & Bateson, Ltd.**, 67-69, Scholefield Street, Birmingham, 7.

**Marshall, F. (Textiles), Ltd.**, Hollins Mill, Marsh, Huddersfield.

**Martindill, Ltd.**, 3-5, Commercial Road, Padlock Wood, Kent.

**Merchant Adventurers, Ltd.**, Hanworth Trading Estate, Feltham, Middx.

**Merseyside Engineering (Refrigeration), Ltd.**, 150, Caryl Street, Liverpool, 8.

**Metamec, Ltd.**, South Green, Derham, Norfolk.

**Metway Electrical Industries, Ltd.**, Metway Works, Canning Street, Brighton, 7.

**Midland Electric Mfg. Co., Ltd.**, M.E.M. Works, Reddings Lane, Birmingham, 11.

**Midland Metal Spinning Co., Ltd.**, Tower Works, Wolverhampton.

**Midland Repetition & Auto Mfg. Co., Ltd.**, Bayton Road, Exhall, Coventry.

**Miller, Wm., (Newcastle), Ltd.**, Railway Terrace, Newcastle-on-Tyne.

**Milliwatt, Ltd.**, 44, Princess Road, London, N.W.1.

**Mirroware Co., Ltd.**, 349, Edgware Road, London, W.2.

**Mitchell Electric Co., Ltd.**, 88-90, Tennant Street, Birmingham, 15.

**Modern Equipment Co., Ltd.**, Court Ash, Yeovil, Somerset.

**Moffats, Ltd.**, 1, Newman Street, London, W.1.

**Monarch Electric, Ltd.**, Vicarage Road, Lye, Worcs.

**Monogram Electric, Ltd.**, Gatwick Road, Crawley, Sussex.

**Morheat, Ltd.**, Church Path, Fareham, Hants.

**Morley, T. B., & Co., Ltd.**, Jameson Street, Hull.

**Morphy-Richards, Ltd.**, 50, Conduit Street, London, W.1.

**Mossley Blanket & Carpet Co., Ltd.**, Mossley, nr. Manchester.

**Nash Electrical Co., Ltd.**, 82, Snow Hill, Birmingham, 4.

**National Pressure Cooker Co. (England), Ltd.**, Wolverhampton.

**New Estate Electrical, Ltd.**, 16-17, Brunswick Street, Leeds, 2.

**New Forest Services, Ltd.**, High Street, Lyndhurst, Hants.

**Nico Light Engineering Co., Ltd.**, 1, Laud Street, Croydon.

**Obbs (George) (1935), Ltd.**, 87-89, Cleveland Street, London, W.1.

**Northern Industries, Snow Hill, Manchester, 4.**

**Nutt Engineering Co., Ltd.**, Stapleford, Cambridge.

**Ormond Eng. Co., Ltd.**, Ormond House, Rosebery Avenue, London, E.C.1.

**Osborn Manufacturing Co., Ltd.**, 5-13, Highgate Square, Birmingham, 12.

**Osler & Faraday, Ltd.**, 89-91, Newman Street, London, W.1.

**Ozonair Engineering Co., Ltd.**, The Esplanade, Rochester.

**Pakamac (Special Products), Ltd.**, Moorside, Oldham, Lancs.

**Parkinson Cowan Appliances, Ltd.**, Birmingham, 33.

**Parnall, see Radiation, Ltd.**

**Partridge, Wilson & Co., Ltd.**, Daventry Electrical Works, Evington Valley Road, Leicester.

**Parvalux, Ltd.**, Broom Road, Parkstone, Dorset.

**Payne & Penny, Ltd.**, 556-558, Kings Road, Chelsea, S.W.

**Pearl Industries, Ltd.**, Birmingham Factory Centre, King's Norton, Birmingham.

**Perihel, Ltd.**, 44, Brunel Road, London, W.3.

**Permaheat (Mossley), Ltd.**, Mossley, nr. Manchester.

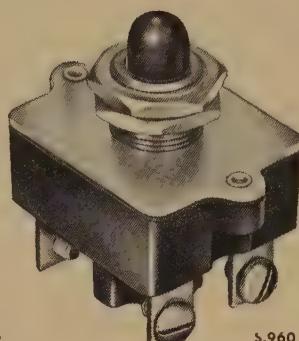
**Permoid, Ltd.**, Aycliffe Trading Estate, Darlington, Co. Durham.

**Philament Electric, Ltd.**, Trading Estate, Bridgend.

**Philips Electrical, Ltd.**, Century House, Shaftesbury Avenue, London, W.C.2.

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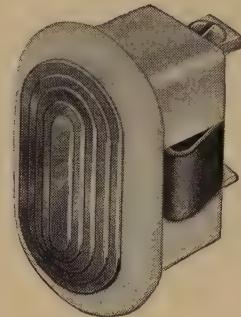
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S.L.162



S.L.50

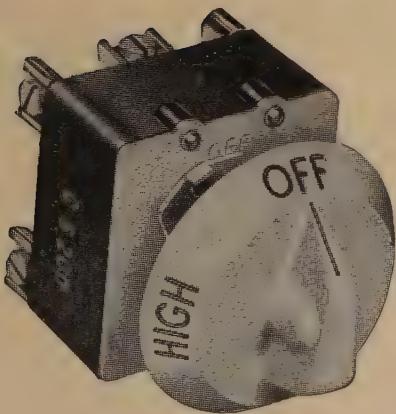


S.L.190

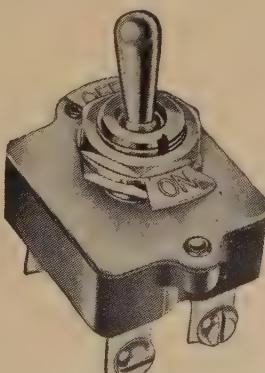
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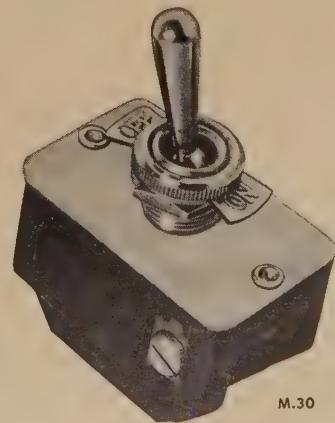
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C.S.200



S.254



M.30

**Phoenix Appliances, Ltd.**, Regina House, Marylebone Road, London, N.W.1.

**Pifco, Ltd.**, Pifco House, Watling Street, Manchester, 4.

**Plieger (London), Ltd.**, 6, Chandos Street, London, W.1.

**Plow Water Heaters, Ltd.**, 6, Newport Road, Cardiff.

**P. & R. Electrical (London), Ltd.**, 1, Berrymead Gardens, London, W.3.

**Pressed Steel Co., Ltd.**, Cowley, Oxford.

**Preston Industrial Research**, 11, Old Bond Street, London, W.1.

**Price, T., & Son (Stampers), Ltd.**, Spring Hill Passage, Spring Hill, Birmingham, 18.

**Priwell Electric, Ltd.**, Spring Vale Mill, Shaw, Oldham.

**Purdy & Cadman, Ltd.**, Houghton Road, Northampton.

**Pyrotenax, Ltd.**, Hebburn, Co. Durham.

**Pyrovac, Ltd.**, Waverley House, Aberdeen.

**Quinnell, R. H., & Co.**, Rowhurst Forge, Oxshott Road, Leatherhead.

**Quiz Electrics, Ltd.**, 160, High Street, Teddington.

**Radiation, Ltd., Electrical Division**, 255, North Circular Road, London, N.W.10.

**Rawlplug Co., Ltd.**, Rawlplug House, Cromwell Road, London, S.W.7.

**Raysol Electrical Co.**, 550, Holloway Road, London, N.7.

**Reelek Appliances, Ltd.**, Skimpot Industrial Estate, Luton, Beds.

**Remington Rand, Ltd.**, 26-40, Kensington High Street, London, W.8.

**REMPLOY, Ltd.**, 415, Edgware Road, London, N.W.2.

**Revo Electric Co., Ltd.**, Tipton, Staffs.

**Ries, B. H., Ltd.**, 19-21, Hatton Garden, London, E.C.1.

**Rippingilles, Ltd.**, Aston Road North, Birmingham, 6.

**Roberts Electrical Co., Ltd.**, 11-13, High Street, Byfleet, Surrey.

**Robson Electrical Products, Ltd.**, Ultralite Works, Union Street, West Bromwich.

**Rochdale Sheet Metal Co., Ltd.**, Wellfield Works, Oldham Road, Rochdale.

**Rogerson Page, Ltd.**, Lower Guildford Road, Knaphill, Surrey.

**Rolls Razor, Ltd.**, 255, Cricklewood Broadway, London, N.W.2.

**Ronson Products, Ltd.**, 352, Strand, London, W.C.2.

**Rotaflex (Great Britain), Ltd.**, 4-10, Nile Street, London, N.I.

**Rowlands Electrical Accessories, Ltd.**, REAL Works, Hockley Hill, Birmingham, 18.

**Rudson, Wood & Co., Ltd.**, 6, Kilburn High Road, N.W.6.

**Runbaken Electrical Products**, 45, Oxford Road, Manchester, 1.

**Russell Hobbs, Ltd.**, 1, Bensham Lane, West Croydon.

**S.L.R. Electric, Ltd.**, Welbeck Road, South Harrow.

**Santon, Ltd.**, Somerton Works, Newport, Mon.

**Sax, Julius, & Co., Ltd.**, 24, Commerce Road, Brentford.

**Schick Inc. (U.K.), Ltd.**, 86a, Brook Street, London, W.1.

**Schulman, Philip S., Ltd.**, 72-76, Laindon Road, Manchester, 14.

**Scottish Precision Engineering Co., Ltd.**, 27, Cadogan Street, Glasgow, C.2.

**Selecta Power Tools, Ltd.**, Hampton Road West, Feltham, Middx.

**Selex Electrical Co. (Kirkby), Ltd.**, Yardley Road, Kirkby Trading Estate, nr. Liverpool.

**Senior, John, & Co. (1954), Ltd.**, Bridge Street, Wednesbury, Staffs.

**Servitor Textiles, Ltd.**, Moorside, Oldham, Lancs.

**Sew-Tric, Ltd.**, Honeypot Lane, Stanmore, Middlesex.

**Shepherd's Aerosols, Ltd.**, Shernfold Park, Frant, Tunbridge Wells, Kent.

**Silical Water Softeners (Domestic), Ltd.**, 237, Southampton Way, London, S.E.5.

**Simister, Samuel, & Co., Copper and Tin Works**, Croston Street, Bolton.

**Simplex Electric Co., Ltd.**, Creda Works, Blythe Bridge, Staffs.

**Simplus Products, Ltd.**, 31-32, Alfred Place, London, W.C.1.

**Sims, H.**, 191, Goldhurst Terrace, London, N.W.6.

**Siroma Engineering Co., Ltd.**, North Acton Road, London, N.W.10.

**Sissons, W. & G., Ltd.**, 75-77, St. Mary's Street, Sheffield, 2.

**Skarsten Manufacturing Co., Ltd.**, 21, Hyde-way, Welwyn Garden City, Herts.

**"Sleep Content" Appliances**, Radiant Works, South Parade, Huddersfield.

**Slumberland, Ltd.**, 11, Conduit Street, London, W.1.

**Smith, Herman, Smithlite, Ltd.**, Empire Works, Dudley.

**Smith, W. H. (Eziot), Ltd.**, 32, Mansfield Street, Church Gate, Leicester.

**Smiths Clocks & Watches, Ltd.**, Sectric House, Waterloo Road, London, N.W.2.

**Sofono Division of Federated Foundries, Ltd.**, 4, Stratford Place, W.1.

**Southern Airframe Products, Ltd.**, Windsor Road, Bexhill, Sussex.

**Speights, Ltd.**, Classic Works, Mill Road, Dewsbury.

**Spencer Metalcraft (London), Ltd.**, East-hampstead Road, Bracknell.

**Sperryn & Co., Ltd.**, Moorsom Street Works, Birmingham, 6.

**Spiral Tube & Components Co., Ltd.**, Osmaston Park Road, Derby.

**Standard Sales, Ltd.**, 74, Borough High Street, London, S.E.1.

**Stanley Bros. of Aldershot, Ltd.**, North Lane, Aldershot.

**Steel Radiators, Ltd.**, Stelrad Works, Southall, Middlesex.

**Stevens, Ernest, Ltd.**, Cradley Heath, Staffs.

**Stokes Fountains, Ltd.**, 185-187, London Road, Croydon.

**Straight-Lite Reflectors, Ltd.**, 36, Eden Grove, Holloway, London, N.7.

**Summerscales, W. S., Ltd.**, Parkside Works, Keighley, Yorks.

**Sunbeam Electric, Ltd.**, 14-16, Old Quebec Street, London, W.1.

**Sutcliffe & Clarkson**, Whittlefield Mill, Burnley, Lancs.

**Tack Air Conditioning, Ltd.**, Longmoore Street, London, S.W.1.

**Tarpen Engineering Co., Ltd.**, Ixworth House, Ixworth Place, London, S.W.3.

**Taylor (Albert) (Manchester), Ltd.**, Isola Works, Quay Street, Manchester, 3.

**Tedex (London), Ltd.**, 2-4, Great Eastern Street, London, E.C.2.

**Teesmade Co.**, 52, Lansbury Drive, Hayes, Middlesex.

**Tellus Super Vacuum Cleaner, Ltd.**, 39, Sheen Lane, Mortlake, London, S.W.14.

**Telsen Electric Co. (1935), Ltd.**, Fitzgeorge Street, Manchester, 9.

**Temperature, Ltd.**, Burlington Road, Fulham, London, S.W.6.

**Thermair Domestic Appliances, Ltd.**, Izons Lane, West Bromwich.

**Thermalay, Ltd.**, Shelf Mills, Shelf, nr. Halifax.

**Thermalux Electrical Products, Ltd.**, Talbot Works, Lewis Street, Halifax.

**Thermega, Ltd.**, 37, Thurloe Street, London, S.W.7.

**Thermodare (G.B.), Ltd.**, 94-98, Petty France, S.W.1.

**Thermoduct, Ltd.**, Viaduct Place, Leeds, 4.

**Thermoelectrics, Ltd.**, Chapel Works, Church Street, Hampton-on-Thames, Middlesex.

**Thermoset Appliances, Ltd.**, Chapel Works, Failsworth, Manchester.

**Thomas, Bertram (Engineers), Ltd.**, Worsley Street, Hulme, Manchester.

**Thomas, Fredk., & Co., Ltd.**, Everton Buildings, Stanhope Street, London, N.W.1.

**Thorn Electrical Industries, Ltd.**, Thorn House, Upper St. Martins Lane, London, W.C.2.

**Tividale Foundry, Ltd.**, Local Board Road, High Street, Watford.

**Tomlinson, F. J., Ltd.**, Hall Carr Mill, Rawtenstall, Lancs.

**Treforest Electrical Services, Ltd.**, Aberbar-ged, Bargoed, Glam.

**Tricity Cookers, Ltd.**, Thorn House, Upper St. Martins Lane, London, W.C.2.

**Troughton & Young (Lighting), Ltd.**, 143, Knightsbridge, London, S.W.1.

**Truvox, Ltd.**, Neasden Lane, London, N.W.10.

**Twentyfirst Century Electrical**, 89-90, New-man Street, London, W.1.

**Tyrad Electric, Ltd.**, Imperial Court, Basil Street, London, S.W.3.

**Unity Heating, Ltd.**, Chilworth Manor, Southampton, Hants.

**Universal Boilers & Engineering Co., Ltd.**, Fulledge Works, Burnley.

**Vactric, Ltd.**, Sloane House, Sloane Street, London, S.W.1.

**Valradio, Ltd.**, Browells Lane, Feltham.

**Vectray, Ltd.**, 16, Princip Street, Birming-ham, 4.

**Vent-Axia, Ltd.**, 60, Rochester Row, London, S.W.1.

**Victor Mfg. Co. (Greengates), Ltd.**, Green-gates, Bradford.

**Vidor, Ltd.**, West Street, Erith.

**Vulcan Fumigator Co., Ltd.**, 3, New London Street, London, E.C.3.

**Walter, J. & H., Ltd.**, Garth Road, Lower Morden, Surrey.

**Wandleside Cable Works, Ltd.**, 106, Garratt Lane, London, S.W.17.

**Ward & Goldstone, Ltd.**, Frederick Road, Pendleton, Manchester, 6.

**Wardle Engineering Co., Ltd.**, Elsinore Road, Old Trafford, Manchester, 16.

**Warmabed, Ltd.**, Hollingworth Lane, Knot-tingley, Yorks.

**Warmalux Mfg. Co., Ltd.**, Kion End Mills, Bradford, Yorks.

**Warmex, Ltd.**, 375, Milton Road, Cambridge.

**Warner, A. E. (London), Ltd.**, 56, Brewer Street, London, W.1.

**Warnford Constructions, Ltd.**, 1, Chesterfield Street, London, W.1.

**Warranty Electrical Products, Ltd.**, 18, Hen-dale Avenue, London, N.W.4.

**Water Softener & Vacuum Cleaner Service, Ltd.**, 248, Romford Road, London, E.7.

**Watson & Sons (Electro-Medical), Ltd.**, East Lane, North Wembley.

**Webb, H. C., & Co., Ltd.**, Tame Road, Bir-mingham, 6.

**Webb's Crystal Glass Co., Ltd.**, 2-3, Norfolk Street, London, W.C.2.

**Welmec Corporation, Ltd.**, 147, Strand, Lon-don, W.C.2.

**Westclox, Ltd.**, Strathleven, Dumbarton, Scotland.

**Westool, Ltd.**, St. Helen's Auckland, Co. Durham.

**Wexen Industries, Ltd.**, Preston, Yeovil, Som.

**White Bros. & Jacobs, Ltd.**, 45-46, Chalk Farm Road, London, N.W.1.

**Wholesale Fittings Co., Ltd.**, 46, 50 and 52, Commercial Street, London, E.1.

**Wilkins & Mitchell, Ltd.**, Phoenix Works, The Green, Darlaston.

**Willer & Robinson, Ltd.**, Green Arrow Works, Maidstone, Kent.

**Williams, R. A. (Birmingham), Ltd.**, Stero Works, Haslucks Green Road, Shirley, Bir-mingham.

**Windak, Ltd.**, Woodside, Poynton, Cheshire.

**Wolf Electric Tools, Ltd.**, Pioneer Works, Hanger Lane, London, W.5.

**Woodmet, Ltd.**, Globe Lane, Dukinfield, Cheshire.

**Wraithes Bros.**, Nuttall Street, Blackburn.

**Wright, G. & S., Ltd.**, Mill Road, Dewsbury, Yorks.

**Wye Valley Hand Weavers**, Ross-on-Wye.

**Wynbourne Electrical Products, Ltd.**, 90-96, City Road, London, E.C.1.



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*In the picture the 'hands' are pre-heating butyl rubber compound ready for extrusion as cable insulation.*



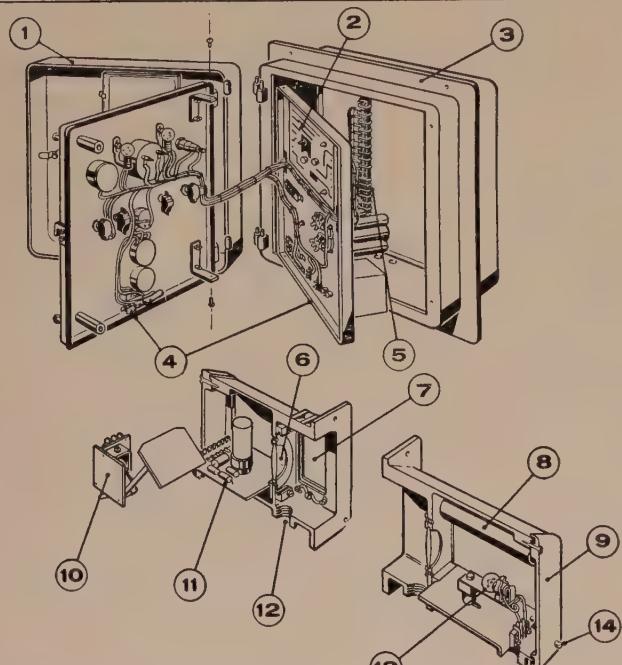
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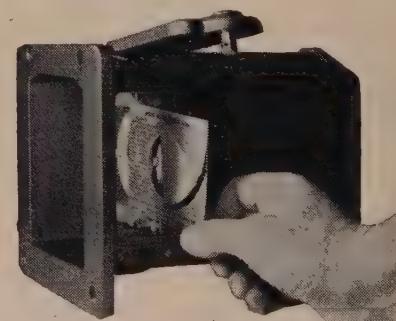
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# KINCARDINE

## OFFICIAL OPENING BY THE QUEEN

AS announced in our issue of 7th October, the South of Scotland Electricity Board's generating station at Kincardine-on-Forth was opened on 13th October by Her Majesty the Queen. The chairman of the Board, Sir John Pickles, presented members of the Board, the chief officers, Mr. Geoffrey Kennedy, Mr. G. Nicholson (station superintendent) and their ladies to Her Majesty and His Royal Highness, Prince Philip. At the opening ceremony, which took place in the canteen, Sir John Pickles, on behalf of the Board, extended a warm welcome to the royal visitors. Improved design and technologies made each new station more efficient than its forerunners. Kincardine, said Sir John, would continue this trend and assist the Board in achieving their duty to establish the most economical system of production and distribution. He mentioned that new generating stations frequently had to occupy good agricultural land, but the ash disposal area at Kincardine would be reclaimed and would give back into agricultural use more than twice the acreage of land occupied by the station. He then asked the Queen to declare the station open and unveil the commemorative plaque.

In her speech, the Queen said that she understood that when Kincardine was in full operation it would supply almost one-third of all electricity generated in Scotland. The station would require two million tons of coal each year, and she was glad that this would give employment to many miners and other workers throughout the nearby

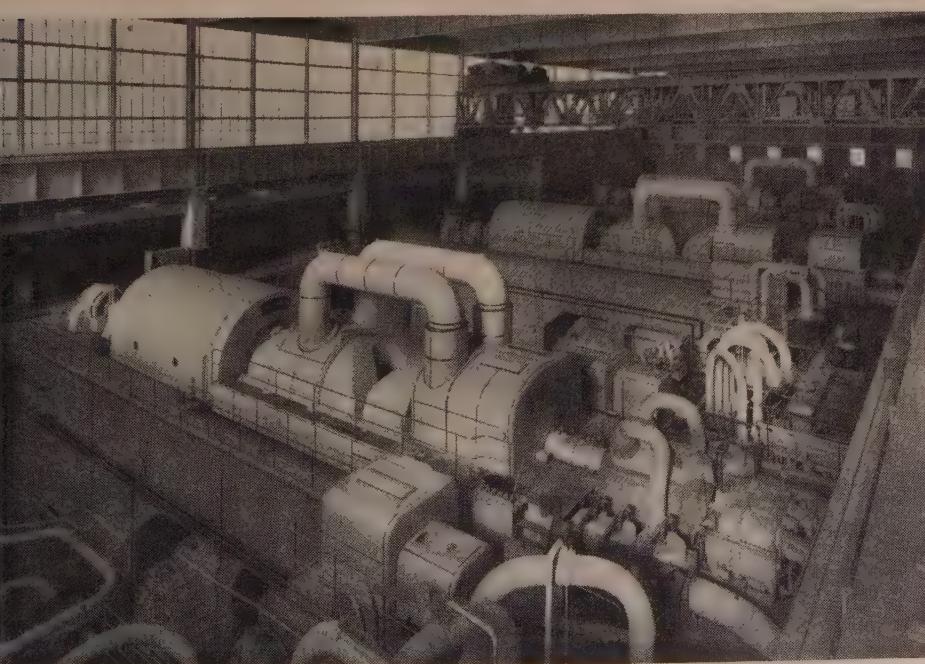


The Queen, accompanied by the station superintendent, Mr. G. Nicholson (centre), talking to Mr. Andrew Taylor in one of the central plant control rooms at Kincardine generating station

coalfields of Clackmannan and Fife. She then congratulated the South of Scotland Electricity Board on their building and on the care and thought which they had given to the men and women who would operate the plant by day and night. Having declared the station open and unveiled the commemorative plaque, the Queen was conducted on a tour of the station by Mr. Nicholson. The Duke was accompanied by the Board's chief engineer, Mr. John Henderson. After viewing the power station, the Queen and the Duke visited one of the new houses which have been provided by the Board for the station staff.

As previously described in detail in the *Electrical Review* of 15th May, 1959, the station is being built in two sections. The first section containing three 120 MW turbo-generator/boiler units is now complete, and the civil structure for the second section, which will contain two 200 MW sets, is well advanced. The steelwork is complete and the alternator structures are nearing completion. The first 200 MW set is due for commissioning in June, 1962, and the second in June, 1963. When completed the station will employ some 270 people. About 15 members of the operating staff are required on each shift for the three sets which are at present in operation.

Turbine hall showing the three 120 MW sets in the completed section of the station



## LETTERS TO THE EDITOR

*Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents.*

### Installation Standards

SINCE the above subject is of paramount interest to the National Inspection Council for Electrical Installation Contracting, and one of their approved contractors is alleged to have been responsible for the installation to which Mr. J. Hartley refers in his letter published in your issue of 7th October, I would like to make the following comment:—

The N.I.C. commenced its inspections of enrolled contractors in January, 1957, and since that date has carried out approximately 12,500 inspections of its enrolled contractors. During that time approximately 26,000 individual installations have been subjected to a thorough examination by the Council's inspecting engineers, such examination being anything but a "brief visual inspection."

During this examination, the wiring installation is sometimes inspected during the erection period; where the installation may be completed, the installation is inspected in roof voids, at access traps under floors and at terminal outlets such as ceiling roses, wall brackets, switches, socket-outlets and consumers' control units.

I can quite confidently state that not one of the installations so inspected during the period of the Council's operations has been carried out with the type of cable mentioned in Mr. Hartley's letter, although it is quite common practice to use single-core p.v.c.-insulated p.v.c.-sheathed cables for domestic wiring installations.

In the progress reports issued by the National Inspection Council from time to time, it has been clearly stated that the standard of installation work has been progressively improved, and there is now a much better understanding of the requirements of the I.E.E. Wiring Regulations by the man who is responsible for carrying out the work on site. Furthermore, there is an increasing observance of Regulation 510, which requires that a signed undertaking shall be given by the contractor that the work has been carried out to the Wiring Regulations. To facilitate this procedure, the Council makes available to all its approved contractors a completion certificate, so compiled that it may be used for complete new installations or extensions to existing installations.

It may very well be, of course, that the installation to which Mr. Hartley refers was completed prior to the inception of the National Inspection Council, which would certainly not permit this type of work to be carried out by one of its approved contractors. Needless to say, the N.I.C. is always prepared to take appropriate action where necessary.

London, W.C.2.

E. J. SUTTON,  
Chief Technical Officer,  
N.I.C.E.I.C.

Mr. Hartley has seen Mr. Sutton's letter and replies as follows:—

It was not my intention to imply that only brief visual

examinations were made by the Council's inspecting engineers, but to emphasise the N.I.C. statement that inspection is necessary to achieve the object of the organisation, that is, the safety of the consumer.

It may be quite an achievement to have inspected 26,000 installations in three years, but this only averages two installations per year per contractor. What happens to the other 101 installations and those carried out by contractors not on the Roll of Approved Contractors?

I would like to know what percentage of contractors make use of the facilities offered by the Council in order to observe Regulation 510, and I venture to suggest that it should be compulsory to submit this statement to the consumer.

### Why Wolverhampton Trolley-Buses Pay

I HAVE read with interest the paragraph relating to this undertaking in your issue of 14th October, but feel I cannot let this pass without some comment.

Whilst the figures you quote are undoubtedly correct, it would be wrong to accept them without reference to the complete picture. Our trolley-bus services operate in the most densely-populated parts of our area and, being confined to the relatively shorter routes, have had the advantage of a greater percentage increase in fares than obtains in the case of motor-bus services. Some of the motor-bus services operate in sparsely-populated country districts and are more of a service to the community than an economic proposition.

The answer to the profit on trolley-buses as against the loss on motor-buses does not lie in the relative operating costs but in the relative income per mile. Reference to our accounts shows that whilst the revenue from trolley-buses was 38.938d/car-mile, from motor-buses it was only 30.963d. In fact, were the working expenses of the motor-buses substituted for the working expenses for the trolley-buses there would have been an even greater profit shown on the trolley-bus services, had they been operated by motor-buses. This again, however, would be a slightly unfair assumption because we have a much more modern motor-bus fleet than trolley-bus fleet.

Wolverhampton, Staffs.

R. H. ADDLESEE,  
General Manager,  
Corporation Transport Department.

### Lamp Life

The October issue of *B.S.I. News* includes a discussion of tungsten filament lamp life. It draws the attention of readers to the technical appraisal in the 15th April issue of the *Electrical Review* and concludes that "The hard fact is, of course, that both lamp life and light output per watt consumed are inseparably determined by the filament working temperature. The better the filament, the higher the light per watt and the shorter the life."

# Electrical Engineers' Exhibition Dinner

A NEW departure by the organisers of the Electrical Engineers' Exhibition was the holding of a dinner to publicise the event. It was held on 13th October at Grosvenor House, London, W.1. There was a distinguished company and the principal guest was Sir Eric Harrison, High Commissioner for Australia.

In proposing a toast to the electrical engineering industry, Sir Eric referred to the rapid growth of electricity consumption in Australia. He said that the prestige of British electrical engineers was high in his country but he regretted that in a number of cases there had been delays in delivery of plant from British firms which had seriously affected constructional timetables; he instanced two cases in connection with the Snowy River hydro-electric scheme. Tenders had been invited for the next major power station, of 760 MW capacity, and a major requirement would be delivery of plant on time.

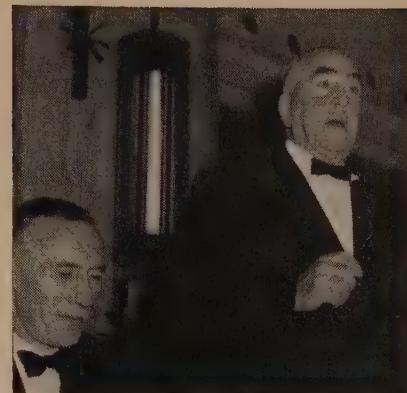
Sir Eric deprecated the lack of interest shown by British civil engineers in important Australian contracts, the value of which ran into many millions of pounds. These contracts, he said, had had to be awarded to American and Continental firms.

In acknowledging the toast, Mr. F. H. S. Brown, deputy chairman of the Central Electricity Generating Board, spoke of the influence of his Board's vast expenditure upon the electrical manufacturing industry. But the Board recognised that they had responsibilities towards the industry; they worked with the manufacturers as a team and claimed that they were as far advanced technically as any like undertaking in the world. They had given the manufacturers a steady home market and had enabled them to offer the world the most up-to-date plant.

Mr. Brown admitted that there had been delays in delivery but he thought that the position was now much improved—if it was not yet good enough.

Mr. R. F. Mathieson, chairman of the Electrical Engineers' (A.S.E.E.) Exhibition Co., proposing "The 1961 Exhibition," said that the dinner marked the beginning of a publicity drive for the exhibition which would grow in intensity right up to the opening day. The demand for

*Sir Eric Harrison speaking at last week's Electrical Engineers' Exhibition dinner. On Sir Eric's right is Mr. F. H. S. Brown, another speaker*



space had been greater than ever and he expressed his regret to those firms who could not be accommodated. Earls Court had become inadequate for such exhibitions but there was no other suitable building. There was an urgent need for a modern exhibition centre which could be financed only by the central Government and maybe the local authorities concerned.

The response was by Mr. W. J. Bird, chairman of the B.E.A.M.A. Domestic Appliance Section, deputising for Sir Leslie Gamage, president of the B.E.A.M.A., who was prevented from attending by a heavy cold. In a witty speech Mr. Bird said that the exhibition was unique because it was free from the over-organisation of the professional organisers. Those running the exhibition understood the needs of the exhibitors and had intimate personal contact with them. For that reason he hoped that the exhibition would not become too large.

The speaker drew attention to the magnitude of the domestic appliance business, which he said was comparable with that of the largest sections of the industry. The domestic appliance makers needed stability in the home market. Given that they could settle down to a regular export plan.

## Control of Large-Scale Organisations

PUBLIC demand for more supervision of large, near-monopolistic, privately-owned industries, and even for public ownership of them, was forecast by Lord Citrine at Seale Hayne Agricultural College, Newton Abbot, Devon, last Friday. He was presenting the George Johnstone Lecture which is sponsored annually by the South Western Electricity Board in association with the College.

Lord Citrine's subject was "The Place of the Large-scale Organisation in the Modern Economy." Large organisations were essential, he said, because of their resources for planning and research. But American experience had shown that, despite very severe legislation, there had been very limited success in preventing combination and abuse of power by large organisations. In this country neither the Government nor the trade unions wanted to suppress competition, but they wished to ensure that the general efficiency redounded to the public interest. There must be a greater measure of accountability by these companies to the public. Could there not be some parallel with the

nationalised industries? He thought that there might be some organisation similar in principle to the Iron and Steel Board.

Lord Citrine felt certain that, as the public perceived that the big privately-owned organisation was approaching complete monopoly, there must be something in the nature of a stimulus to public supervision and perhaps public ownership.

Among those at the lecture were Mr. A. N. Irens, chairman of the South Western Electricity Board, Mr. S. F. Steward, director of the British Electrical & Allied Manufacturers' Association (a former South Western Electricity Board chairman), Sir George Hayter-Hames, chairman of Devon County Council, Lady Carew-Pole, chairman, Electricity Consultative Council, Mr. J. Tristram Beresford, a Board member, Professor Ian Moore, principal of Seale Hayne Agricultural College, and representatives of the National Agricultural Advisory Service and the National Farmers' Union.

## PERSONAL AND SOCIAL

### *News of Men and Women of the Industry*

The following appointments to the boards of its subsidiary manufacturing companies are announced by Crompton Parkinson, Ltd.:—**Mr. A. S. Duncan**, B.Sc., general manager at the Newport works, has been elected to the board of the Young Accumulator Co., Ltd.; **Mr. A. E. Gregg**, general manager at the Chelmsford works, has been appointed to the board of Crompton Parkinson (Chelmsford), Ltd.; and **Mr. J. C. Mansfield**, B.A., and **Mr. D. Ebbin**, who are assistant general managers, respectively, for motor production and lamp production at the Guiseley works, have joined the board of F. & A. Parkinson, Ltd. In addition, **Mr. K. Younger**, general sales manager of the Crompton Parkinson Heavy Plant and Transmission Division, has been appointed to the boards of Crompton Parkinson (Chelmsford), Ltd., the British Electric Transformer Co., Ltd., and Cooke & Ferguson, Ltd. **Mr. C. J. W. Scott**, general sales manager of the Crompton Parkinson Industrial Motors and Lighting Division, has been appointed to the boards of F. & A. Parkinson, Ltd., and Crompton Parkinson (Doncaster), Ltd.

**Mr. S. F. Newey**, B.Sc.(Elec.Eng.), A.M.I.Mech.E., A.M.I.E.E., has been appointed project engineer of the Midlands Project Group of the Central Electricity Generating Board. Mr. Newey had been an assistant project engineer of the Group since last year and was previously senior mechanical engineer at Wolverhampton in the Midlands Division of the C.E.G.B.

A Benjamin presentation : (Left to right) Messrs. R. Leverton, sales engineer, Nottingham and Leicester ; J. D. Ducker, sales engineer, Liverpool and Chester ; H. G. Campbell, managing director ; J. O. K. Purdey, sales director ; D. J. Caddick, sales engineer, Birmingham and district ; and G. R. Hanson, Midland Area manager



He served his apprenticeship with the Brush Electrical Engineering Co., Ltd., and after graduating at Birmingham University he joined the Birmingham Corporation Electric Supply Department.

The Leon Gaster Memorial Premium of the Illuminating Engineering Society for 1960 has been awarded to **Mr. H. C. Weston**, O.B.E., for his paper "Rationally Recommended Illumination Levels," which was presented at the I.E.S. Summer Meeting at Harrogate in May. Mr. Weston was until recently with the Medical Research Council. He was responsible for much of the fundamental work carried out in this country on the basis for recommended illumination levels which has been incorporated in successive editions of the I.E.S. Code.

**Mr. G. F. Roberts**, managing director, and **Mr. W. Bloomfield**, technical director, of the Zenith Electric Co., Ltd., have retired from those positions but retain their seats on the board. The vacancies have been filled by the appointment of **Mr. L. W. Lawrence** and **Mr. J. A. Shorter** as joint managing directors and of **Mr. L. E. Ward** as technical director.

Mr. H. G. Campbell, managing director of the Benjamin Electric, Ltd., at a dinner at the Grand Hotel, Birmingham, on 7th October, presented an engraved gold wrist watch to **Mr. D. J. Caddick**, the company's sales engineer for Birmingham and district,

as the award of merit for sales engineers of the Benjamin Electric for 1959-60.

**Mr. H. Copping**, M.I.E.E., president and managing director of E.C.C. Canada, Ltd., recently arrived in this country. Mr. Copping is visiting the parent companies, the Electric Construction Co., Ltd., and George Ellison, Ltd., and will also visit Tufnol, Ltd.

Following upon the death of Mr. A. E. Hollings, managing director of Dowding & Mills, Ltd., **Mr. G. A. Onion** has been appointed to the board. Mr. Onion will be director in charge of the Birmingham works and **Mr. P. L. Hollings** will continue as director controlling the London and Southampton works. **Mr. W. L. Henderson** is promoted to manager of the London works with **Mr. P. A. Chambers** as assistant, and **Mr. H. Westwood** to manager of the Birmingham works with **Mr. F. J. Gardiner** as assistant.

**Mr. J. H. P. de Villiers**, A.H.W.C., M.I.E.E., has relinquished office after seven years as hon. secretary to the Scottish Centre of the Institution of Electrical Engineers. Mr. de Villiers is succeeded by **Mr. D. R. Rollo**, B.Sc., A.M.I.E.E.

**Mr. J. S. A. Bunting**, M.C., joint general manager of the A.E.I. Cable Division, has been elected a Companion of the Institution of Electrical Engineers.

**Mr. T. H. Thorneycroft**, a director of the Harland Engineering Co., Ltd., has been elected to succeed the late Mr. H. Cowan-Douglas as chairman of the company.

**Mr. J. G. Christopher**, director and general sales manager of Atlas Lighting, Ltd., left England for a visit to South Africa on 16th October. Before returning to England on 8th November he will also visit Thorn's associate company, ILESA, in Italy.

At an informal gathering of fellow directors and managers, **Mr. M. W. Searle**, managing director, was presented at his Eastbourne office with a silver rose bowl to celebrate his twenty-five years with Electra (Birmingham 1935), Ltd. The rose bowl was subscribed for by the managers and staff of the Birmingham, London, Leeds, Eastbourne and Newcastle



Mr. M. W. Searle (right) receiving a presentation card containing the names of subscribers from Mr. A. J. Tanner. (Photo by courtesy of the "Eastbourne Gazette")

branches and was presented by Mr. A. J. Tanner, general manager. Mrs. M. W. Searle received a bouquet from Mr. G. Dinsdale.

**Mr. L. E. Gates**, who has been the representative of Berry's Electric, Ltd., in London and the South-East since 1953, has now been appointed sales manager of the company's Water Heater Division.

The 61st annual dinner and dance of Nalder Bros. & Thompson, Ltd., was held at the Empire Rooms, London, last Saturday. Nearly 300 employees and their friends attended and during the evening Mr. A. G. O'Neill, chairman, presented a radiogram to **Mr. E. W. Semmens**, managing director, to mark his completion of 50 years' service with the company. Mr. Semmens was elected to the board in 1950 and succeeded Mr. O'Neill as managing director in 1957. He is chairman of the Instrument Section of B.E.A.M.A.

The Midlands Branch of the Electrical Trades' Commercial Travellers' Association is holding its annual dinner on Friday next, 28th October, at the Pavilion Suite, County Ground, Edgbaston, Birmingham. Tickets are obtainable from Mr. J. T. Aitken, hon. social secretary, "Carlingwark," 27, Hobart Drive, Walsall, Staffs.

#### OBITUARY

**Sir Charles Bruce-Gardner**.—A memorial service for Sir Charles Bruce-Gardner took place at All Souls, Langham Place, London, on 19th October. Sir Charles, who died on 1st October at the age of seventy-two, was vice-chairman of Crompton Parkinson, Ltd., and was prominent in the steel industry. At the service Mr. Charles F. Dickson, O.B.E., repre-

sented the chairman of Crompton Parkinson, Ltd., Mr. Albert Parkinson, whilst the company was represented by Messrs. J. V. Daniel, R. R. Kenderdine and M. H. L. Lewis, managing directors, and Mr. H. Fawcett, secretary of the company.

**Mr. W. J. Huggett**, O.B.E., M.I.Mech.E., A.M.I.E.E., whose death was announced in our last issue, joined Easton, Anderson & Goolden at Erith as a draughtsman, and later became chief draughtsman of that company, being particularly associated with the design of lifts. In 1916, together with a colleague, and with the support of the General Electric Co., Ltd., he founded and became the first technical director of the Express Lift Co., Ltd. In the same year Mr. Huggett was called in by the Admiralty to help in the design of hydrophone gear, and in conjunction with Dr. A. H. (later Sir Harry) Railing, took over two large engineering works at Witton, Birmingham, for the manufacture of hydrophones used by the British Navy during the first world war.

With the late Arthur Pugh he organised the manufacture at Northampton and Erith of most of the Asdic gear supplied to the Royal Navy during the second world war. This apparatus was largely instrumental in defeating the German U-boat campaign. This work for the Admiralty,

which included the design of aircraft lifts for H.M.S. *Furious*, *Glorious* and *Courageous*, led to his being appointed an O.B.E. in 1956. Mr. Huggett remained a director of the Express Lift Co., Ltd., until March last.

**Mr. H. C. Clements**, B.Sc.(Eng.), who for forty years was associated with the Engineering Division of W. Canning & Co., Ltd., died recently as the result of a motor accident. Mr. Clements was a member of the board of the company from 1953 until last November, when he resigned owing to ill-health.

**Mr. C. K. Woodbridge**, chairman of the Dictaphone Corporation and Dictaphone Co., Ltd., died on 16th October in his 80th year.

**Mr. David Yuille**, T.D., a director of Robert Yuille & Sons, Ltd., Kilmarnock, died on 11th October at the age of fifty-eight.

**Mr. James McKenzie**, J.P., founder and principal of James McKenzie, Ltd., electrical engineers, Birkenhead, died in hospital on 14th October. He was sixty-three.

**Professor A. F. Joffe**, whose work on semiconductors played a significant part in Soviet rocketry, died on 14th October at the age of eighty.

#### THE EARL OF VERULAM

WE report with regret the death on 13th October of the Earl of Verulam, a leading figure in the electrical industry and in a much wider sphere. Lord Verulam was born in London in 1910 and was educated at Eton and Christ Church, Oxford. At Oxford he read zoology and he also interested himself in the social sciences. Later he decided to take up engineering and metallurgy. After experience in an Austrian zinc rolling mill and with the



The late  
Lord Verulam

Vereinigte Deutsche Metallwerke, Nuremberg, he founded Enfield Zinc Products, Ltd., and was managing director from 1933 to 1936. In the latter year he became a director of Enfield Cables, Ltd., and was from 1943 to 1954 managing director of the company. At the time of his death he was chairman of Enfield Rolling

Mills, Ltd., the Engineering & Lighting Equipment Co., Ltd., and Sternol, Ltd.

Lord Verulam was a supporter of the Industrial Co-partnership Association and he had been chairman of the British Institute of Management and the Institute of Industrial Administration. He was a Companion of the Institution of Electrical Engineers and an honorary member of the Institution of Heating and Ventilating Engineers. He had accepted the presidency of the Association of Supervising Electrical Engineers for 1960-61.

Among the social organisations with which he was connected was the Subsistence Production Society of the Eastern Valley of Monmouthshire. He was area organiser, from 1935 to 1939, of this body which was formed to introduce a scheme to relieve unemployment in South Wales.

Lord Verulam became fifth earl in 1949; he is succeeded by his brother, the Hon. John Grimston, who is managing director of Enfield Rolling Mills, Ltd. The funeral took place at St. Albans on Tuesday last and a memorial service is to be held later.

# INDUSTRIAL NEWS

## Semiconductor Production at Southampton

More than 2,000 people now work at the semiconductor plant of Mullard, Ltd., at Southampton. Since construction of this plant began in 1955 rapid progress has been made, and today a works area of 156,000 sq ft is in use. By next spring, an additional 95,000 sq ft will be in service. The plant has been built specifically for the purpose of manufacturing transistors and other semiconducting devices. It operates as a self-contained centre, embracing research, development and application laboratories, and in addition it has its own control room, drawing office, laboratory and other services. Some idea of the progress which has been made can be gained from the fact that during the past twelve months the production rate has doubled. At the same time, the measurement and applications laboratory has been reorganised. It now consists of six separate project groups which, although necessarily interdependent, each explore a different field of semiconductor applications. The work of the laboratory ranges from power and industrial control, telecommunications and computers, to radio and television, measurements and device investigation.

## Need for Study of Effects of Restrictive Practices Act

Mr. William J. Brown, a London solicitor, told the national conference of the British Institute of Management in Harrogate last week that a full-scale study of the effect on industry of the Restrictive Practices Act was of vital importance. No such study had yet been made and perhaps it was too early to expect one. But, he added, "Economists could hardly perform a more useful service."

"Any such study must, if it is to be of value, involve a detailed knowledge of the industry concerned and not merely the application of economic theory without relevance to the individual facts."

"In the case of a few industries where restrictions have been abandoned, price warfare has broken out. In many instances there has been no substantial fall in prices. The period in question has, however, been one of more or less sustained demand. There is as yet no evidence that quality has deteriorated nor could that yet be expected. There is, however, an obvious tendency towards the amalgama-



*This new administration wing at the Mullard semiconductor plant at Southampton accommodates the measurement and applications laboratory*

mation of firms so as to form fewer and larger units in any one industry, such units being better able to withstand such competition as may develop. If this tendency were to increase it might be a matter for anxiety.

"If the effect of the Act has been less than might have been expected it is probably due firstly to the sustained demand which has already been noted, and secondly to the disinclination of manufacturers, learned from many bitter lessons, to indulge in price war. To an increasing extent this has been avoided by the use of what in the United States are called open price agreements whereby the parties concerned notify each other of their own prices and proposed changes. These agreements are as a rule illegal in the United States but are outside the law in this country as it stands at the moment."

Mr. Brown is a partner in Bristows, Cooke & Carpmael, solicitors to the B.E.A.M.A.

## Contract Price Formulae

The British Electrical and Allied Manufacturers' Association has issued the figures for its contract price adjustment formulae. In each case the rate of pay for adult male labour at 14th October is deemed to be 204s 6d. The "costs of materials" figures are: For electrical machinery and equipment the Board of Trade index figures published on 14th October are 181.0

(1949=100) and 116.7 (1954=100); both figures are provisional. For turbo-generating and allied plant: Materials used in mechanical engineering industries 189.8 (1949=100) and 126.3 (1954=100); both figures are provisional. Blast furnaces and iron and steel melting and rolling (40 and 41) 189.5 (1949=100) and other steel goods, excluding tubes (311 and 312), 129.1 (1954=100); both figures are provisional. The price of  $\frac{3}{4}$ in o/d 18 s.w.g. brass condenser tubes (*Metal Bulletin*, 14th October) is 47 $\frac{1}{2}$ d/lb.

## Manufacturers Less Optimistic

"Some relaxation of the 'squeeze' may soon be necessary if domestic demand is to be relied on to justify the heavy industrial investment necessary for future growth." By summing up its latest inquiry into industrial trends in this way the Federation of British Industries effectively adds its voice to those sectors of industry that are pressing for some easing of the present credit restrictions. At the same time the F.B.I. is fully aware of the serious dilemma which the country's economic position poses for the Government. As they point out, the replies to the inquiry emphasise once again that, despite measures taken to reduce home demand, exports have not risen to the extent necessary to support our high level of domestic activity. The scope for a domestic revival is thus limited by our balance of payments situation. And, as the

recent White Paper has revealed, the first half of this year was the worst since 1955.

The troubles of the domestic appliance manufacturers and motor industry tend to be obscured in the general summary of the replies which the F.B.I. publishes. Though the general picture is thus somewhat more encouraging than might have been expected, the previous sustained optimism about the general business situation has lessened. Industry is still in general suffering from a shortage of labour. The proportion of firms working to capacity has changed, but the importance of lack of capacity as the limiting factor to output has lessened.

The steadily rising trend in output shown in the previous four inquiries has continued but at a slackening pace; there are signs that industrial activity is approaching a plateau (the Board of Trade returns suggest that this happened some months ago). More firms are talking about a fall in demand and there has been no significant increase in export orders. With costs rising and little change in selling prices, profit margins are again under pressure.

The most disturbing aspect of the replies, however, is the indication that the difficulties being experienced in some sectors, and these trades were after all intended to suffer, may be influencing industry's collective decision on investment. More companies are still planning to increase their outlay on plant and machinery than are planning to reduce it, but the difference is considerably less than on previous occasions. A slight drop is expected in expenditure on buildings.

#### Cable Contract

The South of Scotland Electricity Board has placed an order valued at approximately £14 million with Scottish Cables, Ltd., a member of the B.I.C.C. Group. The contract covers the supply during 1961 of a wide range of paper and plastic insulated underground distribution cables. Mr. William Fraser, chairman and managing director of Scottish Cables, Ltd., stated that this important order, which was a record for the Renfrew factory, would be a major factor in ensuring a high level of activity and employment during next year.

#### Switchgear for Turkey

Two orders for switchgear equipment for oil refineries in Turkey have recently been placed with South Wales Switchgear, Ltd. One, valued at £20,000, is for 15-panel and 8-panel

switchboards for a refinery at Istanbul. Rated for 150 MVA at 3.3 kV, they are of the single-busbar, air-insulated, indoor pattern. The other contract is a £45,000 order for 250 MVA, 6.6 kV switchgear, control boards, neutral earthing equipment and d.c. units for a new refinery being built by the Foster Wheeler organisation near Mersin.

#### Telephone Development Plan

A five-year development plan for Britain's telephone service has been proposed by the Post Office Engineering Union. The aim is to increase the number of telephones from the present eight million to ten million. Mr. Charles Smith, the Union's general secretary, said on Monday that it had taken four years to install the last million telephones, that was a growth rate of about 3.5 per cent, and the Union was making a modest demand for a steady annual growth rate of 5 per cent. This would involve increasing the capital expenditure on the telephone service from £85 million to between £90 and £95 million and the Post Office's public relations department budget of £500,000 a year should be doubled. Last year the telephone service made a profit of £8.3 million.

#### New U.K.-Sweden Telephone Cable Inaugurated

The Postmaster General, Mr. Reginald Bevins, last week inaugurated a new submarine cable between the United Kingdom and Sweden when he made a call to the Swedish Minister of Communications, Mr. Gosta Skoglund. The complete cable system, which comprises 530 nautical miles of submarine cable, 29 submerged repeaters, submerged equalisers and shore-based terminal equipment, was supplied by Standard Telephones & Cables, Ltd., to the order of the British Post Office. The repeaters used are of the same type as those to be

supplied by Standard Telephones & Cables for CANTAT, the first link (U.K.-Canada cable) in the proposed round-the-world Commonwealth cable. Like the CANTAT repeaters, they have a bandwidth sufficient to carry 60 two-way telephone circuits of 4 kc/s spacing.

This, the first direct telephone cable between the United Kingdom and Sweden, is also the longest submarine telephone cable system in European waters and the longest, to date, using a single cable for both directions of transmission. The submarine cable between Gothenburg, Sweden, and Marske, near Middlesbrough, was laid last summer by H.M.T.S. *Monarch*. The new link, costing £1.2 million, will make available an additional 24 telephone circuits between London and Stockholm. For the present calls will be dialled by operators but later subscribers will be able to dial their own calls direct.

#### High-Speed Multiple-Unit Trains

The British Transport Commission has placed an order, valued at over £580,000, with the General Electric Co., Ltd., for the electrical equipment for twenty-three high-speed a.c. multiple-unit electric trains.

Designed for a maximum service speed of 90 m.p.h., these trains, of which fifteen are four-car and eight two-car, will run between Liverpool Street, London, and Clacton or Walton. The equipment, which may be regarded as the prototype for this type of train, includes transformers, silicon rectifiers, traction motors, control gear and cables.

#### Hunterston Dispute

A new labour dispute has arisen at Hunterston nuclear power station. It concerns 260 welders employed by the Motherwell Bridge & Engineering Co., Ltd., and began with the dismissal of nine welders on 7th October. Contending that these men were wrong-

*The Minister of Commerce for Northern Ireland, Lord Glentoran, recently visited the Dunmurry works of the Walsall Warren Wire Co., Ltd., and was shown round the factory by the managing director, Mr. W. L. Wray. With them in the photograph are the Minister's private secretary, Mr. A. McCullough, and the factory manager, Mr. R. M. Gibson*



fully dismissed, the other welders gave seven days' notice of termination of their employment on 13th October. This decision was taken after talks between representatives of the Boiler-makers' Society and the management had broken down. Last September the company suspended work on its contract after dismissing 500 employees because of "recurring strikes." Work was resumed in January after a new wages structure was introduced.

### **British Nuclear Power Reactor in Holland**

Reactor Centrum Nederland, the Dutch Atomic Energy Foundation, has now put into operation its "JASON" research and training reactor which was produced at the Hawker Siddeley nuclear power factory at Langley, Buckinghamshire. The reactor is said to be the first British reactor to be completed and put into operation in a European Common Market country. Another version of "JASON" is being used for research at the manufacturers' headquarters at Langley and a third is under construction for the United Kingdom Atomic Energy Authority.

### **Ferguson Television Film**

A preview of a film which tells the story of the manufacture of Ferguson television receivers was given in London last week. Entitled "Men of Vision," the film was made at the Enfield works of the Ferguson Radio Corporation, Ltd., claimed to be the largest production unit of its kind in Great Britain. The complete process of television receiver production is traced from the printing of the circuitry on to copper-clad board through to the final testing of the finished receiver. Many of the highly mechanised electronically controlled processes are shown and the commentary is spoken by Raymond Baxter.

The film was written and directed by Mr. S. T. Holmes, group publicity director, Thorn Electrical Industries, Ltd., and the running time is 20 minutes. It is in black and white, 16 mm, and was produced by Artricia Industrial Pictures, Ltd.

### **"EFTA Bulletin"**

Background to the second Ministerial meeting of the Council of EFTA, which was held in Berne, Switzerland, last week, is contained in the first issue of the *EFTA Bulletin* issued by the Information Department of the European Free Trade Association, Geneva. The aim will be to report progress made with the implementation of the Stockholm Convention, the work of the Council and secretariat of the Association and the

closer economic and other relations which are developing between members. In this country copies can be obtained from the Central Office of Information, Hercules Road, Westminster Bridge Road, London, S.E.1.

### **Contractors' Dinner Tickets**

In view of the spread of interest in electrical functions beyond the membership of the associations organising them, the Electrical Contractors' Association (14, Bedford Row, London, W.C.1) has decided to allow non-members to purchase tickets for its annual dinner. This event is to take place on 14th February next at Grosvenor House, London, W.1, and tickets will cost £2 2s each.

### **Indian Atomic Power Station**

Our Indian correspondent writes: Tenders are invited by the Atomic Energy Commission for a complete atomic power station of a capacity of 300 MW to be constructed at Tarapur, about 100 miles from Bombay city. Two nuclear reactors of 150 MW each, operating with natural uranium as fuel, have been specified, but there is a provision for alternative proposals based on enriched fuel, if found economic. An important stipulation is that the contractor will be expected to keep the foreign exchange content of the price to the minimum and to use or employ to the greatest extent possible, Indian materials, locally fabricated equipment and Indian personnel. The last date for tenders is 31st May next.

There is a provision in the Third Plan for an atomic station of 300 MW capacity and further proposals for expansion are understood to be under consideration. The cost of the power station at Tarapur is estimated at Rs.53 crores or £40 million.

### **Trade Announcements**

Domestic radio sets, radiograms, record players and tape recorders are being launched on the British market by **Magnavox Electronics, Ltd.**, a subsidiary of the American Magnavox company. A limited number of dealers will be selected as outlets for the company's products.

**Line Equipment, Ltd.**, have moved to larger premises at 71a, Queen Victoria Street, London, E.C.4. The telephone number (City 1841) is unchanged.

**Davis & Timmins, Ltd.**, are opening a new branch office and store at Crowley Road, Swalwell, Newcastle-upon-Tyne, on 31st October.

The address of Mr. G. South, **Ekco Heating** general sales representative for Yorkshire and the North-East

Coast area, is now 19, Baronsmead, Whitkirk, Leeds, 15.

The address of the Birmingham office and depot of **Oldham & Son, Ltd.**, is now Norwood Road, Bordesley Green, Birmingham, 9. The telephone number (Birmingham Victoria 1994) remains unchanged.

**Winston Electronics, Ltd.**, have appointed Hawnt & Co., Ltd., 112-114, Pritchett Street, Birmingham, 6, as their Midland distributors.

The telephone number of **Leicester, Lovell & Co., Ltd.**, North Baddesley, Southampton, has been changed to Rownhams 2131.

**Atlas Lighting, Ltd.**, have appointed Mr. R. A. Barrington as area manager for the London North sales area, operating from 105, Judd Street, W.C.1.

**Conduit Distributors, Ltd.**, have moved to Leek Street Corner, King's Cross Road, London, W.C.1 (telephone: Terminus 7842).

### **Price Reductions**

**Lancashire Dynamo Electronic Products, Ltd.**, announce reductions averaging 10 per cent in the prices of their range of comprehensive resistance welding controls, Series CRW.1.

Reductions in the prices of silicon diodes are announced by Hughes International (U.K.), Ltd. These diodes are stated to be available now at prices normally associated with germanium devices.

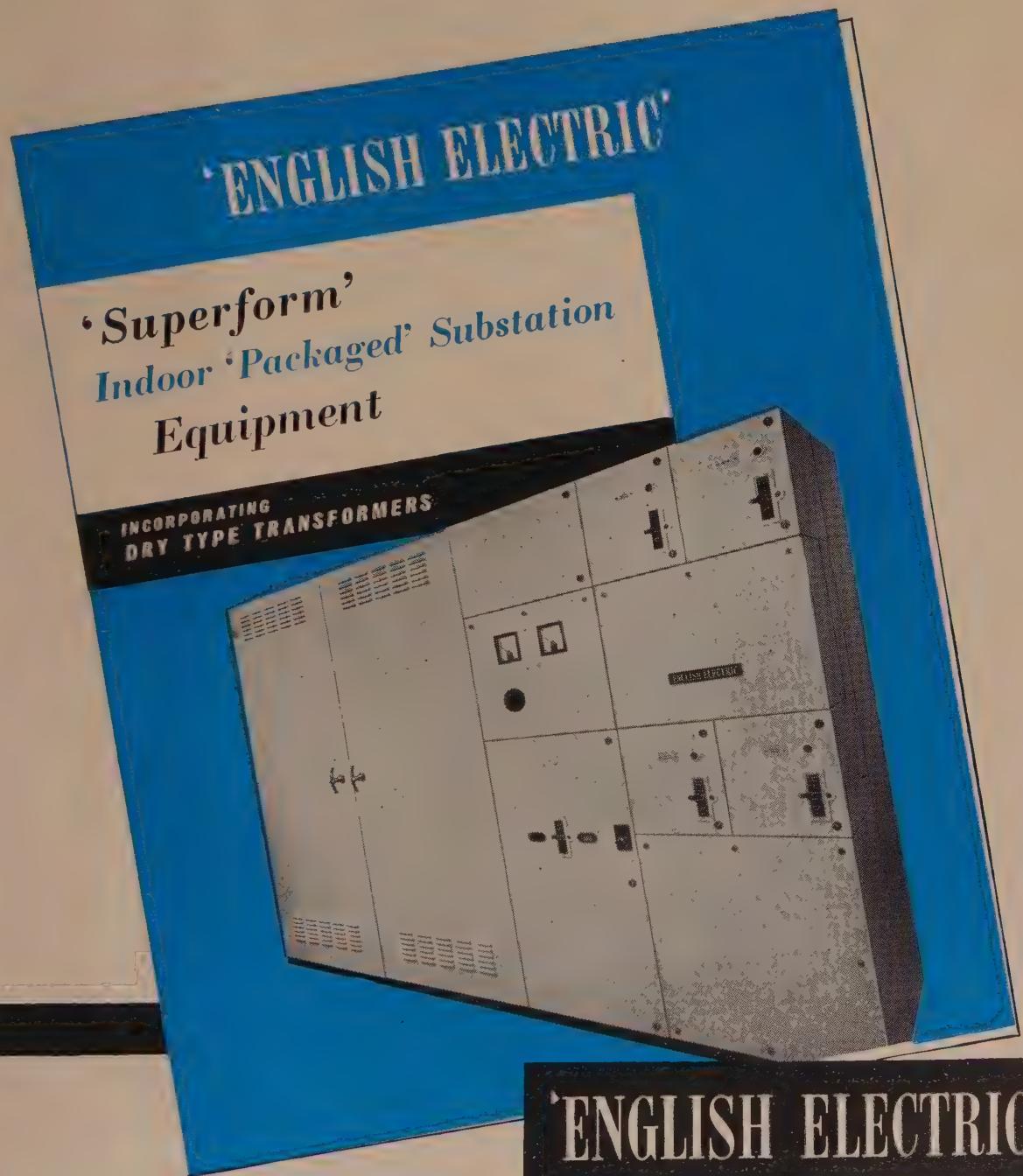
### **Rhodesian Power Board Profit**

Against an expected loss during the first two years' operation of the Kariba plant, the Federal Power Board of Rhodesia and Nyasaland reports a net surplus of £350,520 for the year ended 30th June, 1960.

Sir Duncan Anderson, the chairman, said in London on Monday that the Board now proposed to finance 50 per cent of the second stage of the project from accumulated surpluses and had already set aside £300,000 of the current surplus for this purpose. The second stage would raise the total capacity by 900 MW to 1,500 MW. The final average cost per kilowatt of installed capacity when completed would be £80 but construction work would not start until about 1965.

Speaking in Salisbury, Sir Malcolm Barrow, Federal Minister of Power, said that the actual cost of power from Kariba had been 0.472d per kWh, against a forecast of 0.869d per kWh, and the forecast for mixed hydroelectric/thermal power of 0.757d per kWh had been reduced to an actual figure of 0.579d.

# what is a 'Packaged' Substation ?



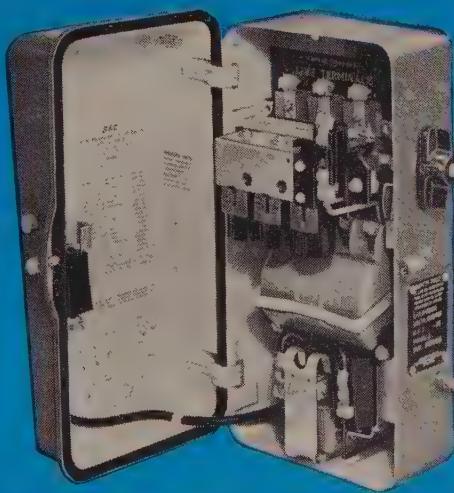
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G.E.C.

## NEW ELECTRICAL EQUIPMENT

### Transistorised Relay

A three-stage transistor amplifier has been produced by B. & R. RELAYS, LTD., Temple Fields, Harlow, Essex, for fitting integrally with their M.01 relay, and the resulting compact M.01/T transistorised plug-in unit effectively replaces a large "system" which would otherwise have to be engineered by the customer. An

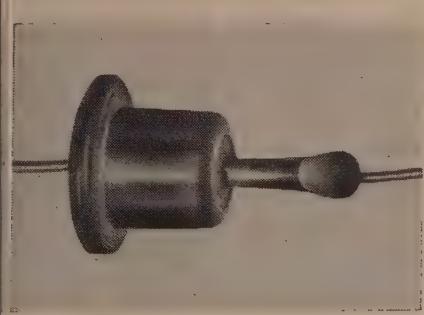


B. & R. Relays transistorised relay

operating sensitivity of the order of  $5 \mu\text{A}$  may be achieved, and the power consumption is  $0.5 \text{ W}$  at a nominal  $6$  or  $12 \text{ V d.c.}$  The complete unit weighs only  $6 \text{ oz}$ , and it is designed for multiple ancillary circuit operation on receipt of a signal as low as  $10 \mu\text{W}$  at the input.

### Junction Rectifiers

An improved design of Type SJ wire ended silicon junction rectifiers has been introduced by the Electronic Apparatus Division of ASSOCIATED ELECTRICAL INDUSTRIES, LTD., Rugby. This will replace the A.E.I. Form "B" rectifier and will meet Services specifi-



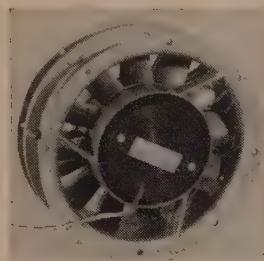
The new A.E.I. rectifier

cations and other requirements where space saving is an important consideration. The new rectifiers, which are to be known as Form "F," have a smaller flange, i.e.  $\frac{13}{32} \text{ in}$  maximum diameter instead of  $\frac{17}{32} \text{ in}$ . The devices will thus be more convenient for use in printed circuits. The ratings of the Form "F" rectifiers are identical to those of the corresponding Form "B"

types and are given in Information Sheet EAD 8018 (obtainable from A.E.I. Valve and Semiconductor Sales, Carholme Road, Lincoln). Prices will be as for the corresponding Form "B" rectifiers.

### Axial Flow Fans

A range of "Secomak" fans to the designs of their associated French company has recently been marketed by the SERVICE ELECTRIC CO., LTD., Secomak Works, Honeypot Lane, Stanmore, Middlesex. These axial



"Secomak" axial flow fan

flow fans are intended principally for the electrical and electronic industries and their applications include the ventilation of drawers and containers; cooling valves, printed circuits and lamps; and the pressurisation of racks. Special features are a flat construction for space economy, and quiet operation. Their sizes range from  $2\frac{3}{4} \text{ in}$  to  $11\frac{1}{4} \text{ in}$  impeller diameter in 1, 2, 3 and 4 stages, with outputs up to  $850 \text{ c.f.m.}$  at pressures up to  $4 \text{ in w.g.}$  They are available for all standard a.c. voltages at from 50 to 400 c/s as well as d.c. from  $6 \text{ V}$ . Static convertors are available to run a.c. fans on d.c. supplies.

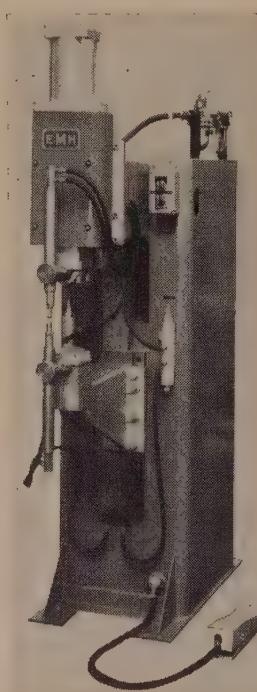
### Spot Welder

The Type M.50 Mk. III medium-duty spot welder recently introduced by ELECTRO MECHAN-HEAT, LTD., Lower Teddington Road, Kingston-upon-Thames, Surrey, has a nominal rating of  $50 \text{ kVA}$  at a 50 per cent duty cycle and has been designed primarily for use with 18-22 gauge bright mild steel sheet. The machine, producing up to 300 spot welds per minute, is suitable for stitch-welding.

The welding head is fitted with hardened steel rollers mounted on ball bearings and machined at the periphery to a V-shaped profile. Welding pressure at the electrode tips is of the order of  $1,100 \text{ p.s.i.}$  at an air line pressure of  $80 \text{ p.s.i.}$  An air reservoir reduces the effect of pressure

irregularities due to small bore feed pipes when working at high welding speeds. As an optional extra a "high lift" air cylinder can be fitted which allows the electrode tips to be opened to a maximum of  $5 \text{ in.}$

The electrode clamps on the upper and lower arms may be turned horizontally through  $180^\circ$  to facilitate the spot welding of long sections. The electrode holders can be adjusted vertically in the clamps, and the lower arm can be raised or lowered through an  $8 \text{ in}$  movement. Two foot pedals are supplied with machines incorporat-



Electro Mechan-Heat spot welder

ing the "high lift" air cylinder. The first brings the welding head down to a normal spot-welding position, the second initiates the welding cycle. The welding cycle is controlled by a 3- or 4-stage electronic timer in conjunction with an ignition contactor. Squeeze, weld, forge and off time can each be varied between 3 and 70 cycles—based on a 50 c/s supply—by stepless controls fitted to each stage of the cycle.

The machine is equipped with a stacked-core transformer and heat regulation is obtained through an eight-position tap link panel. The equipment is normally supplied to operate on any two phases of a  $400/440 \text{ V } 50 \text{ c/s}$  three-phase supply.

## Financial Section

# STOCKS and SHARES

STOCK EXCHANGE markets have been subdued by the continuing evidence of difficulties for the makers of such goods as motor-cars, some domestic equipment and television sets, who were given little encouragement last week from the Chancellor of the Exchequer to hope for an early relaxation of the credit restrictions. An impression was made also by the rather less optimistic conclusions in the latest survey of trends conducted by the Federation of British Industries, which draws wide and respectful attention. Industrial share prices have become depressed in some sectors, but on the whole have reflected no serious concern about business prospects; the average of prices is still much nearer the highest than the lowest points of the year.

### Electrical Shares

Shares of the big electrical groups have remained right out of favour, and as a result of considerable further depreciation over the past week, new low points for the year were recorded in A.E.I. (on which the yield now exceeds 7 per cent), in both of the shares concerned with the English Electric-G.E.C. merger talks, in Crompton Parkinson, Parsons and Reyrolle. Elsewhere, some of the shares associated with home appliances, motor accessories and radio again turned dull after the Chancellor's references to hire-purchase controls. Lucas, at 64s, lost more than half the previous week's gain of 6s 9d, and there were recessions in such shares as S. Smith, Hoover, Pye and E.M.I. The remarkable rise in Dimplex was maintained, however, to the extent of a further 2s 6d, bringing the price to a new "high" of 48s 6d, while E. K. Cole were firm and very active at around 27s 6d.

### Mixed Changes

Crabtree Electrical shares, which had surged up from 29s 3d to 38s in the previous week, reverted to 34s after a statement from the directors to the effect that they knew nothing to substantiate the freely circulating rumours of a "take-over" bid. Plessey reacted rather sharply to 51s, with the premium on the new shares down to 15s 3d, and Ericsson Telephones lost 1s 6d to 24s 6d, but recessions elsewhere seldom exceeded a shilling and the trend was not all one way: Bulpitts, Ever Ready

and Sangamo were among those to make headway.

### Company News

Results of Engineering & Lighting Equipment for the first part of the year ending next March are said in a state-

ment from the company to justify an increase in the interim payment from 5 to 7½ per cent on larger capital. For last year there was a total distribution of 15 per cent and the annual report referred to the successful development of general business, particularly in

### Price Changes in

Company or Board	Nom. Value	Middle price 17th Oct.	Rise or Fall	Week's		Dividend	1960	
				Pre- vious	Last		Yield %	High- est
Gilt-edged Stocks								
Brit. Elec. 1968/73	... ... 100	74½	+½	3	3	4 0 6	79½	74
Brit. Elec. 1974/77	... ... 100	70	-	3	3	4 5 9	76	69
Brit. Elec. 1976/79	... ... 100	72½	-1	3½	3½	4 16 6	79½	72½
Brit. Elec. 1974/79	... ... 100	82	+½	4½	4½	5 3 9	90½	81
Brit. Elec. 1967/69	... ... 100	90	-	4½	4½	5 0 0	97½	90
Overseas Electric Supply								
Calcutta Elec.	... ... £1	21/-	-	7†	7½†	11 14 0	21/-	19/3
East African Power	... ... £1	15/9	+3d	8	10	12 14 0	20/3	15/-
Nigerian Elec.	... ... £1	17/-	-	8	10	11 15 0	19/9	15/6
Perak Hydro-Elec.	... ... £1	20/-	-1/-	10	10	10 0 0	21/-	15/3
Electrical Shares								
Aberdare Holdings	... ... 5/-	15/9	-	17½	17½	5 11 0	19/-	14/6
Aerialite	... ... 1/-	7/9	-3d	54	54	6 19 0	9/6	7/3
Allen, W. H.	... ... £1	40/-	-6d	12	14	4 13 3*	43/9	34/6
Allied Insulators	... ... 5/-	10/-	-	—	20	5 0 0*	11/6	9/9
Anglo-Portuguese Tel.	... ... £1	23/9	-3d	9	9	7 11 6	29/-	23/9
Arcolectric	... ... 1/-	4/6	-	—	15	3 6 9	5/6	4/-
Aron Meters	... ... £1	86/3	+1/3	15	15	3 9 6	86/3	47/-
Assoc. Elec. Ind. Ord.	... ... £1	42/6	-3/-	15	15	7 1 3	66/6	42/6
Automatic Tel. & El.	... ... 5/-	16/6	-	17	17	5 3 0	21/9	15/4½
Babcock & Wilcox	... ... £1	34/-	-	13	9	5 6 0	48/9	33/6
Bakelite	... ... 10/-	57/6	-1/3	15	17½	3 0 9	62/6	40/-
Baldwin, H. J.	... ... 2/-	2/3	-	20	—	—	2/6	1/9
Berry's Electric	... ... 5/-	44/-	+3d	20	30*	3 8 3	44/-	29/6
Bowthorpe Holdings	... ... 2/-	8/-	-3d	27	18½	4 12 6	11/6	7/9
Brit. Elec. Resistance	... ... 2/-	9/3	-3d	20	15*	3 4 9	10/3	5/6
Brit. Elec. Traction:								
Def. Ord. "A"	... ... 5/-	47/-	-6d	35	40	4 5 0	49/3	42/-
B.I. Callender's	... ... £1	51/3	-9d	13½	13½	5 5 3	61/-	50/-
B.I. Callender's 6% Pref.	... ... £1	18/6	-	6	6	6 9 9	21/-	18/6
British Thermostat	... ... 5/-	25/-	-	35	20*	4 0 0	26/-	21/3
Brook Motors	... ... 10/-	48/-	-	25	25*	4 9 3*	53/6	43/9
Bulgin, A. F.	... ... 1/-	9/6	-3d	50	55	3 17 0*	10/3	8/-
Bulpitts	... ... 5/-	19/6	+1/-	15	16½	4 3 3	23/3	16/9
Burco Dean	... ... 5/-	10/-	-3d	18	15½	7 10 0	15/9	10/-
Cable & Wireless	... ... 5/-	17/6	+9d	10	10*‡	2 17 3	18/3	14/3
Chloride El. Storage "A"	... ... £1	73/9	-9d	20	17½*	4 15 0	81/-	65/6
Clarke Chapman	... ... £1	48/-	+1/9	13½	13½	5 14 6	63/9	45/-
Cole, E. K.	... ... 5/-	27/6	+6d	20	22½	4 1 9	31/9	19/9
Combined Elec. Mfrs.	... ... 4/-	8/3	-3d	—	12½‡	6 1 3	—	—
Contactor Switchgear	... ... 5/-	16/3	-	14	14	4 6 3	17/9	14/6
Cossor, A. C.	... ... 5/-	5/9	-3d	5	Nil	—	10/-	5/9
Crabtree	... ... 10/-	34/-	-4/-	20	22½‡	3 6 3*	39/-	24/-
Crompton Parkinson	... ... 5/-	11/-	-1/-	12	14	5 2 0*	15/-	11/-
Davis & Timmins	... ... 5/-	34/6	-	25	25*‡	3 12 6	35/-	17/-
De La Rue	... ... 10/-	66/3	-	22½	22½*‡	3 7 9	78/6	47/9
Decca "A"	... ... 10/-	41/6	+9d	20	23½	5 12 0	51/3	40/9
Desoutter	... ... 5/-	47/6	+1/3	21½	30	3 3 3	48/-	37/6
Dewhurst	... ... 2/-	7/-	-	20	20	5 14 3	8/6	7/-
Dictograph Tel.	... ... 2/-	8/9	+3d	20	20	4 11 6	9/9	7/9
Dimplex	... ... 5/-	48/6	+2/6	—	30	3 1 9	48/6	26/9
Dubilier Condenser	... ... 1/-	2/6	-3d	25	30	6 0 0*	3/3	2/6
Duport	... ... 5/-	22/-	-	12½	17½	3 19 6	30/3	22/-
E.M.I.	... ... 10/-	46/-	-1/6	20	17½*	3 16 0	58/9	45/-
Electrical Apparatus	... ... 5/-	17/6	-6d	14½	20	5 14 3	18/3	12/9
Electrical Components	... ... 5/-	9/6	-	15	11½*	6 1 0	13/9	9/6
Elec. Construction	... ... £1	36/3	-	9	9	4 19 3	43/-	31/3
Elliott-Automation	... ... 5/-	28/-	-	9½	12‡	2 2 9	36/-	19/9
Enfield Rolling Mills	... ... £1	49/6	+6d	15	15	6 1 3	56/-	48/-
English Electric	... ... £1	32/6	-2/3	14	10*	6 3 0	53/-	32/6
English Electric 3½% Pref.	... ... £1	11/9	-	3½	3½	6 7 9	13/-	11/-
Ericsson Tel.	... ... 5/-	24/6	-1/6	13†	13†	4 7 0	28/6	22/6
Ever Ready	... ... 5/-	34/3	+6d	27½	20*	2 18 6	34/6	23/-
Falk Stadelmann	... ... £1	31/6	-1/-	10	10	6 7 0	35/9	31/-

The above quotations are based upon middle prices in the Stock Exchange Daily Official List.

\* After scrip issue.

† Free of income tax.

‡ Dividend indicated.

street lighting, in addition to the traditional work for the shipbuilding industry. The 2s shares were quoted at 7s 6d. J. & F. Stone have announced a 50 per cent expansion in trading profits and a 5 per cent increase in the dividend to a total of 35 per cent.

Affected however by considerations of hire-purchase restrictions, the 5s shares eased to 26s 3d.

### Decca Dividend

Market expectations were well satisfied with Decca's preliminary statement

of the results for 1959-60, disclosing improvements of 15 per cent in turnover, 12 per cent in trading profits and as much as 22 per cent in the net surplus to just over £1½ million, after a smaller tax charge. The dividend goes up again to a total of 2s 4d per share (23½ per cent) and is covered twice by available earnings—a margin rather wider than it was for last year's payment of 2s per share. After the announcement the 10s ordinary shares moved up to 47s and the more active "A" (non-voting) shares to 41s 6d, the respective yields on the new dividend rate being approximately 5 and 5½ per cent.

### Cossor Prospects

In his first address as the chairman of A. C. Cossor, Sir Miles Graham did not encourage shareholders to expect much improvement in the company's fortunes during the current year. He said that it would take time for results to appear from the measures taken to solve the troubles which involved a trading loss, and the passing of the dividend, for the year ended last March. An increase in the actual order book, prospects of more business for the radar and communications divisions, and improved conditions in the cable industry were among the factors he mentioned as contributing a gleam of light to the outlook. The price of the 5s shares was little further altered at 5s 9d.

### Alwyn Holdings Results

The 12½ per cent dividend declared by Alwyn Holdings, and the group profit of £186,000 for the year ended in June, are both well ahead of the estimates published when the company's 5s shares were brought to the market last year. In the interval they have more than doubled in value. At their current price of 20s 9d they offer a yield of only 3 per cent, but the distribution appears to be covered more than five times by the latest earnings, and the company has now paid off the greater part of the outstanding cash consideration for the acquisition of Rashleigh Phipps, the operating subsidiary; it was the directors' intention to restrict dividends until this debt had been discharged.

### John Thompson Refrigeration Division

A refrigeration division is being formed by John Thompson (Wolverhampton), Ltd., based on its main group of factories in Wolverhampton. For some years now, the South African company of John Thompson, Ltd., has been engaged on refrigeration work, both in the manufacturing and contracting fields.

## Electrical Investments

Company or Board	Nom. Value	Middle price 17th Oct.	Week's Rise or Fall	Dividend		1960		
				Pre-vious	Last	Yield %	High-est	Low-est
<b>Electrical Shares—continued</b>								
G.E.C. ...	... £1	34/6	-4/-	10	10	5 16 0	47/6	33/6
G.E.C. 6½% Pref. ...	... £1	20/-	+6d	6½	6½	6 10 0	22/3	19/6
General Cables ...	... 5/-	4/9	-3d	15	Nil	—	10/-	4/9
Goblin (B.V.C.) ...	... 5/-	7/-		7½	12½	8 18 6	13/9	6/6
Hackbridge Holdings ...	... 5/-	15/3		20	20	6 11 3	17/3	14/3
Harland Engineering ...	... 5/-	15/-	-3d	14	16*	5 6 8	16/3	13/-
Head Wrightson ...	... 5/-	23/-		20	14*	3 0 9	31/6	20/6
Heatrae ...	... 2/-	11/6	+1/-	20	22½	3 18 3	12/3	8/9
Holophane ...	... 5/-	18/9	-1/3	26	30	8 0 0	20/6	17/-
Hoover ...	... 5/-	43/9	-1/3	60	90	5 2 9*	55/-	39/6
Intl. Combustion ...	... 5/-	23/3	-9d	30	30	6 9 0	46/9	23/3
Intl. Computers & T. ...	... £1	71/6	-6d	—	10	2 16 0	78/6	61/6
Johnson & Phillips ...	... £1	18/-	-3d	5	Nil	—	24/-	18/-
Laurence Scott ...	... 5/-	19/3		15	15*	3 18 0	25/3	18/-
Lister, R. A. ...	... £1	52/-		12½	14	5 7 9	62/-	52/-
Lucas, J. ...	... £1	64/-	-4/-	10	12½	3 18 3	74/6	61/3
Marryat & Scott ...	... 2/-	15/-	-9d	22½	27½	3 13 3	16/9	14/-
Mather & Platt ...	... £1	48/9		10½	11	4 10 3	59/-	45/-
Metal Industries ...	... £1	60/-	-4/6	14	15	5 0 0	76/3	58/9
Midland Elec. Mfg. ...	... £1	60/-		10	12	4 0 0	61/-	53/6
Murex ...	... £1	71/6	-1/-	15	20	5 12 0	77/-	62/6
Newman Ind. ...	... 2/-	5/-		10	12½	5 0 0	5/3	4/-
Oldham & Son ...	... 1/-	2/6		17½	17½*	7 0 0	3/-	1/9
Parsons, C. A. ...	... £1	44/-	-2/3	8½	9½	4 5 3	59/-	44/-
Philips' Lamps ...	... Fl.10	240/-		13·3	17	1 8 6	£12½	137/-
Plessey ...	... 10/-	51/-	-2/6	15½‡	17‡	3 6 9	60/-	44/3
Pye ...	... 5/-	16/6	-6d	12½	15	4 11 0	19/-	14/9
Pyrotenax ...	... 5/-	54/-		34	40	3 14 0	56/-	44/3
Radiation ...	... £1	33/3	-9d	6	12	7 4 6	44/6	33/3
Reliance-Clifton ...	... 5/-	24/9	-9d	15	15	3 0 6	28/-	22/-
Reyrolle ...	... £1	33/9	-2/-	17½	17½	5 3 9*	52/3	33/9
Richardsons Westgarth ...	... 10/-	8/-		8½	8½	10 8 6	14/9	8/-
Sangamo Weston ...	... 10/-	24/-	+1/-	12½	11*	4 11 9	24/-	19/3
Simon Engineering ...	... 5/-	32/-		—	26·6‡	4 3 0	32/6	29/3
Smith (England), S. ...	... 4/-	15/6	-1/-	12½	17½	4 10 3	20/-	15/6
Southern Areas ...	... £1	15/9		Nil	5	6 7 0	16/-	13/-
Strand Elec. ...	... 5/-	12/9		20	14·6*	5 14 3	14/-	10/6
Sturtevant ...	... 5/-	15/-	-1/3	15†	15†	8 3 0	24/3	15/-
Sun Elec. ...	... 5/-	17/6		25	15*	4 5 9	17/6	15/-
T.C.C. ...	... 10/-	43/6		25	35	5 7 3*	48/3	37/3
Telephone Rentals ...	... 5/-	22/9		12½	15*	3 6 0	24/-	17/-
Thompson (John) ...	... 5/-	17/-	-6d	25	20	5 17 9	25/9	17/-
Thorn Elec. ...	... 5/-	49/6	-6d	20	25	2 10 6	55/6	44/3
Thorneycroft ...	... £1	22/6		7½	6	5 6 9	31/-	22/6
Tube Investments ...	... £1	87/6		20	13‡	2 19 3	95/6	65/3
Ultra Electric ...	... 5/-	17/3	-1/-	20	25	7 15 0	29/-	17/3
Vactric ...	... 5/-	7/9	-6d	37½	15	—	43/9	6/9
Walsall Conduits ...	... 4/-	12/3		22½	15*	4 18 0	16/-	12/-
Ward & Goldstone ...	... 5/-	30/-		30	35	2 18 3*	31/3	25/6
Watford ...	... 2/-	7/6	-6d	25	25	5 6 9*	14/-	7/6
Westinghouse ...	... £1	45/6	-6d	10	11	4 16 6	59/9	45/-
West, Allen ...	... 5/-	12/-	-3d	12½	12½*	5 4 3	17/-	11/9
Wilkins & Mitchell ...	... 5/-	16/3	+3d	17	21*	6 9 3	25/9	16/-
Wolf Electric ...	... 5/-	14/-		10	12½	4 9 3	14/9	10/9

## REPORTS and DIVIDENDS

**Crabtree Take-over Rumour.**—In view of the persistent rumours in circulation regarding "take over" negotiations involving Crabtree Electrical Industries, Ltd., the directors state that no negotiations have taken place or are contemplated between the company and any other parties and they have no knowledge of anything likely to have prompted this rumour.

**Aron Meters Loan Stock.**—Mr. J. S. F. Pollitzer, a shareholder in Aron Meters, asks holders to vote against authorising the directors to apply for a quotation for any new ordinary shares resulting from conversions of the recently placed £162,000 loan stock.

He thinks that it is quite unnecessary to raise finance on terms allowing the lender to convert his loan into equity capital, and that the more conventional methods of bank financing would be more to the advantage of the existing equity holders.

It is too late to undo the loan stock issue, placed by Rea Brothers, states Mr. Pollitzer, but "it would seem that shareholders can secure that no quotation for any ordinary shares which may be issued as a result of the exercise of conversion rights can be obtained, and by so doing demonstrate to the directors that prior approval of the shareholders should be obtained to transactions of this kind instead of ratification being sought after the transaction."

**A. C. Cossor, Ltd.**—In his address circulated with the report and accounts, the chairman (Major-General Sir Miles Graham, K.B.E.) said: "You are entitled to expect from your management not only explanations, but action, and of this I can assure you there has been plenty since I have been at the head of your business. I cannot make any promises, but, since becoming chairman I have, with the help of my fellow directors, made an exhaustive survey of the various subsidiaries. In consequence energetic steps have been taken (a) to put into practice substantial economies, (b) to increase efficiency by engaging the services of top executives, in particular in the fields of science, production and sales, (c) to build up a substantial order book for future years.

"What we have done must necessarily take time to fructify, and since we are already nearly half-way through the current year, it would be wrong of me to encourage you to think that there will be much improvement in this period.

"Nevertheless, we believe we have a

grip of our problems and that the measures we are taking will solve them. Both the increase in the actual order book and the prospects of large orders for the Radar Company, the restoration of relative peace in the cable industry, the encouraging demand for our communications products, and the receipt of substantial income as opposed to expenditure on our Highbury properties will, undoubtedly, make a contribution and provide a gleam of light on what has been a stormy horizon."

**Vactric, Ltd.**, which has been in the hands of the receiver since 7th October, is suspending production by its manufacturing subsidiary, Vactric (Manufacturing), Ltd., and steps are being taken to put this company into creditors' voluntary liquidation.

It has been stated that a bid for this subsidiary may be made by the Longford Electric Co., Ltd., which reports an increasing demand for its washing-spin drying machines and is having to seek new factory premises.

**A.E.I. Dividend Policy.**—The board of Associated Electrical Industries, Ltd., has decided to pay future ordinary dividends in half-yearly instalments—the final in April with an interim in October. The change is made in response to replies received to a questionnaire sent out in July, which showed that a substantial majority of the 70 per cent of ordinary shareholders who replied preferred half-yearly payments.

**The Nuclear Investment Co., Ltd.**, is paying an interim dividend of 2½ per cent and the intention is to declare dividends totalling 5 per cent for the year ending 31st March, 1961. A total of 4½ per cent for the year 1959-60 included an interim of 2 per cent prior to a one-for-three rights issue.

**J. & F. Stone, Ltd.**, reports a sharp recovery in profits for the year ended 30th June, 1960, and the dividend is raised 5 per cent to 35 per cent with a final payment of 22½ per cent. The group trading profit of £915,802 compares with £617,121, and the net profit of £386,269 with £280,775.

**The Engineering & Lighting Equipment Co., Ltd.**, is raising its interim dividend from 5 per cent to 7½ per cent, on capital increased under an acquisition, for the year ending 31st March, 1961.

**Stothert & Pitt, Ltd.**—With a final dividend payment of 15 per cent, the same as last year, the company's total payment for the year remains un-

changed at 20 per cent. The group profit, before tax, increased by 10 per cent to £1,008,328; net profit was £530,828 against £498,860.

**The Anglo-Portuguese Telephone Co., Ltd.**, is making an issue to shareholders of 1,900,000 £1 ordinary shares at 21s each. The issue is basically by provisional allotment on the basis of one new ordinary for every £5 ordinary or "A" ordinary stock held on 21st October.

**Sydney S. Bird & Sons, Ltd.**—In view of the adverse trading conditions it is impossible to pay an interim dividend for 1960. (Last year there was a single payment of 20 per cent.) A circular is being sent to shareholders.

**Mavor & Coulson, Ltd.**, announces an interim dividend of 4½d per share on increased capital, the same as last year.

**Babcock & Wilcox, Ltd.**, has declared an interim dividend of 4½ per cent, the same as last year.

### New Companies

**Sharkie & Huntbatch, Ltd.**—Registered 29th August. Capital £15,000. To acquire the business of the late Joseph L. Huntbatch carried on at 32a, Upper Brook Street, Manchester, 13, as "Sharkie & Huntbatch" and to carry on the business of manufacturers of and dealers in switches and other articles made from bakelite, micanite, etc. Directors: G. A. Spencer, G. S. Marr, J. A. Young, H. Cunliffe and J. A. Evans. Secretary: B. S. Walton. Regd. office: Cumberland House, Lissadel Street, Pendleton, Salford, 6.

**Darstan, Ltd.**—Registered 23rd September. Capital £1,000. Electrical engineers and contractors, manufacturers of and dealers in all kinds of electrical instruments, radio apparatus, etc. Directors: F. W. Standing and W. Standing (secretary). Regd. office: 26, Rayleigh Road, Thundersley, Essex.

**Victoria Electronics, Ltd.**—Registered 22nd September. Capital £1,000. Electrical engineers and contractors, electronic engineers, radio and television engineers, etc. Directors: G. C. J. Hunt and E. Gale (secretary). Regd. office: 7, Victoria Street, Einglefield Green, Egham, Surrey.

### Bankruptcies

**G. B. Solomon**, radio and electrical dealer, carrying on business at 57, Fore Street, St. Columb, Cornwall, as St. Columb Radio.—Last day for receiving proofs for dividend 25th October. Trustee: Mr. J. E. Ellis, 50, The Terrace, Torquay.

**L. J. Wotton**, radio and electrical engineer, carrying on business at 76, Babbacombe Road, Torquay.—Second and final dividend of 5½d in the £ payable at 50, The Terrace, Torquay.

**G. H. Cornwell**, carrying on business as "Tele-Speed," at 21, Rockmount, Pitt Lane, Bideford, Devon, electrical retailer.—Trustee: Mr. J. E. Ellis, 50, The Terrace, Torquay, appointed 30th September.

**B. G. Slater**, lately residing and carrying on business at 12, George Street, Exmouth, Devon, as an electrical engineer.—Application for discharge to be heard at The Castle, Exeter, on 24th November.

**A. Owen and L. G. A. Shaw**, lately carrying on business in co-partnership as Owen & Shaw, electrical contractors, at Corner Shop, Cross Roads, Hixon, Stafford.—First meeting held 18th October. Public examination 2nd December at the Guildhall, Stafford.



### UNIT CONSTRUCTION

embodying Combination Fused Switches from our ASTA Type Tested 30 MVA range. 60 amperes to 750 amperes. Standardised dimensions permit ease of assembly. Great flexibility of layout and facilities for extensions. All units are for front access only.

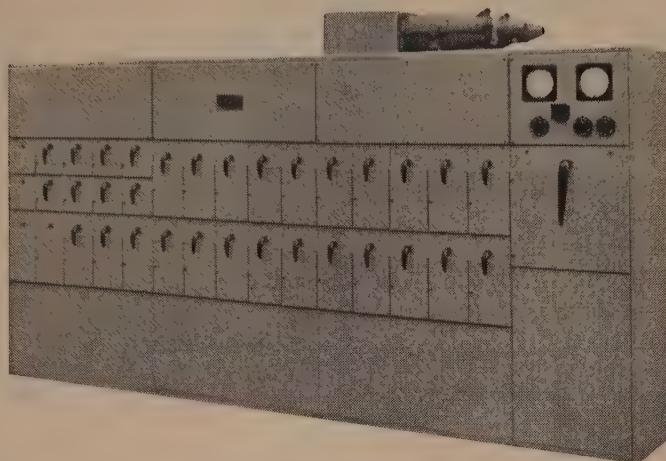
Our other products include:—

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Tubes from  $3/64"$  to  $\frac{5}{8}"$  o.d.  
From  $3/32"$  to 20 ft. lengths.  
From 0.006 to 0.064 wall thickness.  
In general purpose, close or precision tolerances.  
In super purity, commercial purity or alloys.

# we hardly recognise ourselves

*Everyone has a use for*

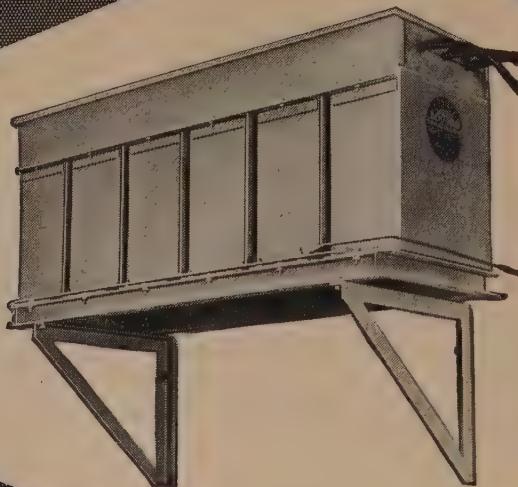
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*Tubes*

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### **UNIT CONSTRUCTED POWER FACTOR CORRECTION CAPACITOR BANK**

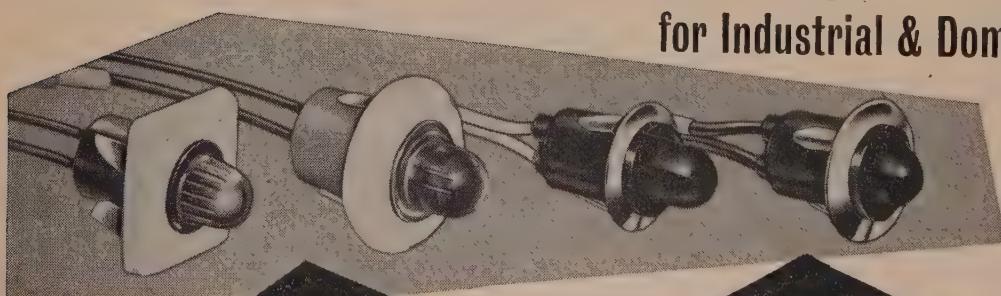
# **DUBILIER**

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for Industrial & Domestic Applications



**80A - 82A  
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SHALLOW LENS**

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# GENERATION AND DEVELOPMENT

## Power Failure in Sussex

On 13th October there was a power failure in Sussex which received considerable publicity. In fact, the interruption lasted only three minutes and about 25,000 consumers were affected. The line in question was one side of a 33 kV double circuit South Eastern Electricity Board line between Fishergate and Worthing. This line, built before the war, had been out of service for two months for constructional work. On 13th October the line was cleared, the circuit-breaker racked in and then closed to energise the line. However, malicious damage had been done, wire netting and weighted wire having been thrown up on the line, some of it, apparently, only that morning. The switch was thus closed on to a fault but, due to a defect in the tripping circuit (a faulty contact in the secondary plugs of the breaker), the switch did not trip. An overload was therefore imposed on the incoming transformer, the protective gear associated with which finally cleared the fault. There is, of course, a time lag between the operation of the breaker protective gear and transformer protective gear, and during this period the fault current caused the line to break near Lancing.

## L.E.B. at the Willesden Show

About 29,000 people visited this year's Willesden Show, which was held recently in Roundwood Park. All the floral illuminations in the park, and the lighting for more than 100,000 sq ft of canvas housing over 7,500 exhibits, were provided and installed by the North Western District of the London Electricity Board. The Board's marquee included fourteen manufac-

turers' exhibits and there were continuous demonstrations of cooking, water heating, clothes- and dish-washing.

## London Trolley-bus for Paris Museum

A 22-year-old trolley-bus, which has been presented by London Transport to the Association pour le Musée des Transports Urbains, Interurbains et Ruraux for its Paris museum, left the Edmonton depot recently for shipment to France. The vehicle is No. 796, one of the 150 Class H.1 trolley-buses with Leyland chassis and Metropolitan-Cammell-Weymann bodies built in 1938 for use in the pre-war tram conversion scheme.

## Mont Orgueil Castle Floodlighting

Referring to the note in last week's issue on the floodlighting installation at Mont Orgueil Castle, Jersey, the London Electric Firm, Ltd., tell us that they designed and built the four 90 cm high intensity arc-lamp projectors for the scheme.

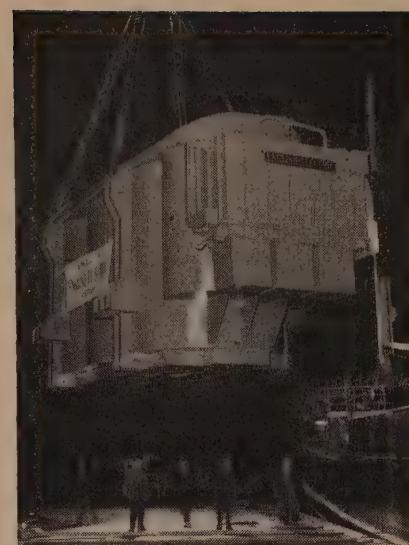
## Transport Undertaking's Profit

During the year ended 31st March last, South Shields Corporation transport undertaking, which operates trolley-buses and motor-buses, made a net profit of £13,793, an increase of over £10,000 on the previous year.

## OVERSEAS

### Peruvian Development Plan

The building of a hydro-electric plant on the Mantaro River would be the first step in a long-term plan which the Government of Peru has produced for opening-up the interior and



*The first of six English Electric 110 MVA main generator transformers for the Hinkley Point nuclear power station being lifted out of the M.V. "Caborn" at Combe-which. The transformer, weighing 110 tons, was shipped from Birkenhead*

developing the resources of the country. The "Peru-Vía" plan, as it is known, was put before the Governments of various European countries by President Prado earlier this year in order to enlist financial and technical assistance.

The hydro-electric station would have an initial capacity of 700 MW which could later be doubled or trebled. It would provide power for a smelting plant and refinery for the lead and zinc mined in the area, and the Central Railway from the coast to the high sierra could also be electrified.

*The Times* Lima correspondent reports that an investment of £50 million is envisaged for these schemes and the technical problems involved are now being studied by a mission from Federal Germany. Once this stage has been completed, further projects are contemplated covering a large area of almost virgin territory in Southern Central Peru. The central and southern railway systems would be linked by an electrified longitudinal line, from which a series of feed roads could penetrate east and west to all parts of the region.

This stage of the project is said to have aroused interest in British industrial circles and Señor Rizo-Patrón, the author of the plan, is at present in London for discussions.

Other Government projects include the construction of several small hydro-electric and steam plants in other parts of Peru, finance for which has been promised by the French Government.

*A feature of the L.E.B. display at this year's Willesden Show was the information stand in an attractive garden setting*



# NEW PATENTS

## Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (3s 6d each including postage) are obtainable from the Patent Office, 25, Southampton Buildings, London, W.C.2

**1947**

12529. Bauer, S. G.—Nuclear reactors. 26th April, 1948. (848901.)

**1955**

29768. Head Wrightson & Co., Ltd.—Nuclear reactors. 18th January, 1957. (849001.)

31101. Solartron Electronic Group, Ltd.—Analogue computers. 24th October, 1956. (849262.)

33282 and 33461. British Thomson-Houston Co., Ltd.—Electrical circuit arrangements. 4th December, 1956. (848667/8.)

33947. Simplex Electric Co., Ltd.—Centrifugal drying machines. 26th November, 1956. (848908.)

35984. Electric & Musical Industries, Ltd.—Transistor amplifiers. 17th December, 1956. (848669.)

36090. Electric & Musical Industries, Ltd.—Correcting for transmission variations in colour television channels. 6th December, 1956. (848907.)

36185. Siemens Edison Swan, Ltd.—Two-condition electric circuit arrangements using gas filled diodes. 14th December, 1956. (849104.)

**1956**

119. Electric & Musical Industries, Ltd.—Mica members in electrical devices. 3rd January, 1957. (848875.)

3905. Calidec, Ltd.—Method of and apparatus for use in the installation of electrical elements in matrixes. 8th February, 1957. (848703.)

6553. Electric & Musical Industries, Ltd.—Automatic machine tools. 19th February, 1957. (848685.)

7442. English Electric Co., Ltd.—Electrically propelled vehicles. 11th March, 1957. (849213.)

14402. Boulton Paul Aircraft, Ltd.—Plug and socket connections for multiple electric conductors. 9th May, 1957. (849004.)

18227. English Electric Co., Ltd.—Apparatus for supplying a d.c. load from an a.c. source. 11th September, 1957. (849005.)

24072. Parsons & Co., Ltd., C. A.—Fuel elements for nuclear reactors. 12th July, 1957. (849216.)

25709. Yardney International Corporation.—Manufacture of porous electrode bodies for primary or secondary electric cells or batteries. 22nd August, 1956. (848706.)

36327. Square D Co.—Electrical panel-board. 28th November, 1956. (848935.)

36560. British Oxygen Co., Ltd.—Electric arc welding torches. 26th November, 1957. (848544.)

36610. Simplex Electric Co., Ltd.—Centrifugal drying machines. 30th November, 1956. (Cognate applications 2096, 21st January, 1956, and 30065, 2nd October, 1956.) (Divided out of 848908.) (848909.)

37796. National Research Development Corporation.—Cathode ray tubes. 11th December, 1956. (849276.)

37850. Sperry Rand Corporation.—Magnetic core structure and method of preparing same. 11th December, 1956. (848700.)

37908. Square D Co.—Electrical panel-board. 12th December, 1956. (848546.)

37994. Burroughs Corporation. Bi-stable state magnetic core device. 12th December, 1956. (849264.)

38274. General Electric Co.—Electric control system for conveyor lines. 14th December, 1956. (848709.)

38308. Yardney International Corporation.—Electrode for a primary or secondary electric cell or battery. 14th December, 1956. (849266.)

38765. Stempel-Hermetik G.m.b.H.—Electromagnetically driven compressors. 19th December, 1956. (848889.) 38764. Electrically driven compressors. 19th December, 1956. (848900.)

38899. Lumalampen A.B.—Starting circuit for electric discharge lamps. 20th December, 1956. (848548.)

39149. Bosch G.m.b.H., R.—Electrical high frequency interference suppressors for ignition systems. 24th December, 1956. (849268.)

39411. Brown, Boveri & Cie. A.G.—Current measuring device for high voltage plants. 28th December, 1956. (849182.)

39645. Cetel Centre d'Etudes et de Developpements de l'Electronique.—Methods of manufacturing unidirectional conducting elements. 31st December, 1956. (848755.)

**1957**

579. British Thomson-Houston Co., Ltd.—Multi-cavity magnetrons. 12th February, 1958. (849920.)

1933. Philips Electrical Industries, Ltd.—Method of manufacturing a cathode having a porous tungsten body. 18th January, 1957. (848885.)

2615. Telemecanique Electrique.—Electromagnetic relays. 24th January, 1957. (849164.)

2623. Soc. d'Electronique et d'Automatisme.—Electrical digital computers. 24th January, 1957. (848891.)

2811. General Electric Co., Ltd.—Dynamo-electric machines. 14th January, 1958. (848520.)

3481. Babcock & Wilcox, Ltd.—Nuclear reactors. 30th January, 1958. (849277.)

3303. Licencia Talalmanyok Ertekesito Vallalat.—Primary or secondary cells. 30th January, 1957. (848855.)

5181. British Telecommunications Research, Ltd.—Electrical signalling circuits employing transistors. 14th February, 1958. (848553.)

6950. Metropolitan-Vickers Electrical Co., Ltd.—Electron discharge tubes. 21st February, 1958. (848954.)

9836. National Research Development Corporation.—Commutator systems. 12th June, 1958. (849168.)

10091. Siemens & Halske A.G.—Automatic frequency control arrangements for frequency shift telegraph receivers. 27th March, 1957. (848559.)

10584. British Thomson-Houston Co., Ltd.—Control equipment for nuclear reactors. 1st April, 1958. (848521.)

12619. Mechanical Products, Inc.—Electric circuit-breakers. 17th April, 1957. (848522.)

13363. M.T.E. Control Gear, Ltd., and Olley, N. H.—Electric protective devices. 25th July, 1958. (848958.)

14218. Bylock Electric, Ltd.—Induction motors. 5th May, 1958. (848959.)

14349. Lancashire Dynamo Electronic Products, Ltd.—Device for detecting small changes of capacitance. 30th April, 1958. (848568.)

15106. General Electric Co.—Electroluminescent networks. 13th May, 1957. (848961.)

15130. United Kingdom Atomic Energy Authority.—Nuclear reactors. 8th May, 1958. (849225.)

17413. British Thomson-Houston Co., Ltd.—Limit switches. 30th May, 1958. (848842.)

21543. Philips Electrical Industries, Ltd.—Electronic timing devices. 8th July, 1957. (849009.)

23149. Beckman Instruments, Inc.—Electrical resistance element and method of making same. 22nd July, 1957. (849305.)

26366. Mechanical Products, Inc.—Electric circuit-breakers. 21st August, 1957. (848574.)

26899. General Electric Co., Ltd.—Heat exchangers. 19th August, 1958. (849011.)

28360. Minister of Supply.—Electrical plug and socket type connectors. 8th December, 1958. (849231.)

28537. Pye, Ltd.—Transistors. 3rd September, 1958. (849013.)

29473. United Kingdom Atomic Energy Authority.—Nuclear reactors. 12th September, 1958. (849308.)

29691. Young, W.—Electric switch for controlling mechanisms or apparatus. 22nd December, 1958. (849014.)

30319 and 35185. Parsons & Co., Ltd., C. A.—Fuel elements for nuclear reactors. 11th August and 20th October, 1958. (849157 and 848723.)

31219. British Thermostat Co., Ltd.—Thermally controlled electric switches. 2nd October, 1958. (849311.)

32896. Crabtree & Co., Ltd., J. A., and Morgan, R. W.—Mounting boxes for electrical accessories. 20th October, 1958. (848984.)

34827. Francais, Etat.—Devices for transmitting electrical signals indicative of the position of a member through a sealed partition. 8th November, 1957. (848722.)

35120. Electricals, Ltd., Shortt, J. S., and Bell, W. B.—Apparatus for calculating intensity of illumination. 4th December, 1958. (849233.)

36681. A.M.P., Inc.—Methods of and die sets for crimping electrical connectors about conductors. 25th November, 1957. (848643.)

37671. Postmaster General.—Transistor amplifier circuits. 2nd December, 1958. (849316.)

38291. Turner, W.—Glands for armoured electric cables. 9th December, 1958. (849235.)

39129. Tung-Sol Electric, Inc.—Snap-action electric switches. 17th December, 1957. (848582.)

40443. Philips Electrical Industries, Ltd.—Manufacture of dispenser cathodes. 31st December, 1957. (848886.)

**1958**

26432. Peyron, A. F. R.—Electric voltage stabiliser. 18th August, 1958. (848369.)

31976. Siemens & Halske A.G.—Capacitor charging systems. 7th October, 1958. (848377.)

34825. Westinghouse Electric Corporation.—Electric circuit interrupters. 30th October, 1958. (848177.)

35984. Okonite Co.—Apparatus for testing electric cable insulation. 10th November, 1958. (848180.)

37208. Schrack, E.—Electrical snap switches. 19th November, 1958. (848294.)

37554. General Electric Co.—Electrical contact making brushes. 21st November, 1958. (848295.)

38268. Westinghouse Electric Corporation.—Electric circuit interrupters. 27th November, 1958. (848184.)

38656. Telefonaktiebolaget L. M. Ericsson.—Apparatus for indicating and locating gas leaks in gas protected cables divided into a number of gas tight sections. 1st December, 1958. (847764.)

40389. Telefonaktiebolaget L. M. Ericsson.—Electromagnetic relay sets for use for example in an automatic telephone exchange. 15th December, 1958. (847896.)



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MAKING  
COILS**

Foil coils have many advantages :

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Structural stability  
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"	"	1" Carbon Steel Holsaw
"	"	1½" Carbon Steel Holsaw
3	"	2" Carbon Steel Holsaw Blades
3	"	1" Carbon Steel Holsaw Blades
3	"	1½" Carbon Steel Holsaw Blades
2	"	1" Pilot Drills
"	"	CT8 Carbide Drill
"	"	CT10 "
"	"	CT12 "
"	"	CT14 "
"	"	A14 1½" Wood Auger
"	"	A38 ¾" Wood Auger
"	"	A12 ½" Wood Auger
"	"	A58 ½" Wood Auger
"	"	A34 ¾" Wood Auger
"	"	Set of 4 High Speed Twist Drills (⅛", ¼", ⅜", ½")
"	"	20 ft Extension Lead with Connector

\*DR 3 GP — Saw-grip

DR 4 GP — Pistol-grip

DR 5 GP — Side Handle grip

State model when ordering

Supplied in strong, attractive carrying case

PRICE £22.2.0



# Bridges

Contractor's Kit is tailor-made for time-saving.

S. N. BRIDGES & COMPANY LIMITED

Manufacturers of Better-class Power Tools. YORK ROAD, BATTERSEA, S.W.11

## NEXT WEEK'S EVENTS

*Organisers of electrical functions are advised to make use of the "Electrical Review" clearing house, Room 221, Dorset House, Stamford Street, London, S.E.1, to ascertain that proposed dates for their functions do not clash with others already arranged.*

**MONDAY, 24th OCTOBER**

**Birmingham.**—James Watt Memorial Institute, 6 p.m. I.E.E. South Midlands Electronic and Measurement Group. "Automatic Control of Machines for Assembling Bicycle Parts," by A. V. Hemingway and R. L. Dressler.

**Bolton.**—Technical College, 6.15 p.m. I.E.E. North Western Centre. Discussion on Selection of Students for Appropriate Courses," to be opened by Professor G. W. Carter and A. J. Jenkinson.

**Brigg.**—Angel Hotel, 7 p.m. I.E.E. Sheffield Sub-Centre. Chairman's address, "Electrical Contracting in Commerce and Industry," by E. J. Lilleker.

**Cardiff.**—South Wales Institute of Engineers, Park Place, 6 p.m. I.E.E. Western Utilisation Group. Chairman's address, "Developments in Electrical Plant for Industry," by J. M. Ferguson.

**Carlisle.**—Technical College, 7 p.m. I.E.E. North Eastern Centre. "Safety in the Utilisation of Electricity," by S. J. Emerson.

**Ipswich.**—Electric House, 6 for 6.30 p.m. I.E.E. East Anglian Sub-Centre. "Electrical Installation Practice," by E. J. Sutton.

**London.**—Institution Building, Savoy Place, W.C.2, 6.30 p.m. I.E.E. London Graduate and Student Section. Chairman's address by A. Porter

**Manchester.**—Electrical Engineering Department, The University, 7 p.m. I.E.E. North Western Graduate and Student Section. "A.C. and D.C. Variable Speed Drives," by E. Hall.

**MONDAY, 24th OCTOBER to FRIDAY, 28th OCTOBER**

**Leamington Spa.**—Electrical Development Association. Industrial conference.

**TUESDAY, 25th OCTOBER**

**Carlisle.**—Technical College, 7 p.m. I.E.E. North Eastern Centre. "Safety in the Utilisation of Electricity," by S. J. Emerson.

**Coventry.**—Alfred Herbert Hall, 7 p.m. I.E.E. South Midland Centre Graduate and Student Section. "Stereophonic Sound," by K. N. Hawke.

**Fareham.**—H.M.S. Collingwood, 7.30 p.m. A.S.E.E. Portsmouth and District Branch. "Safety in the Utilisation of Electricity," by S. J. Emerson.

**Gloucester.**—Saracen's Head Hotel, 7.30 p.m. Institute of Metal Finishing, South West Branch. "Metal Finishing in the Instrument Industry," by F. C. Carpenter.

**London.**—Savoy Place, W.C.2, 5 for 5.30 p.m. I.E.E. Measurement and Control Section. "Rapid Methods for Ascertaining whether the Activity of a Weak Radioactive Sample Exceeds a Predetermined Level," by E. H. Cooke-Yarborough and R. C. M. Barnes.

26, Portland Place, W.I, 6.30 for 7 p.m. Society of Instrument Technology. "Instrumentation Past, Present and Future," by L. S. Yoxall.

**Manchester.**—Engineers' Club, 6.15 p.m. I.E.E. North Western Supply Group. "Field Suppression of Turbo-Alternators," by J. R. Hill, A. Hunt, W. J. Joyce and D. H. Tompsett.

College of Science and Technology, Jackson Street, 6.30 p.m. Institution of Chemical Engineers, North Western Branch. "Computers and their Application in Chemical Engineering," by D. W. Holman and J. J. Settle.

**Stafford.**—Swan Hotel, 7.15 p.m. I.E.E. North Staffs. Graduate and Student Section. Repetition of chairman's address by G. H. Gillam.

**WEDNESDAY, 26th OCTOBER**

**Birmingham.**—Birmingham Exchange and Engineering Centre, Stephenson Place,

10.30 a.m. Combustion Engineering Association, Midland Region. Discussion "Scheduled Maintenance of Boiler Plant and Auxiliaries," to be opened by F. W. C. Hinton.

College of Advanced Technology, 6 p.m. I.E.E. South Midland Education Discussion Circle. "The Non-Destructive Testing of Materials," by Dr. J. C. Wright.

Midland Institute, 6.30 p.m. I.E.E. South Midlands Centre and Institutions of Civil and Mechanical Engineers. "Some Aspects of Engineering in Polar Regions," by D. L. Pratt.

Department of Electrical Engineering, University of Birmingham, Edgbaston, 7.15 p.m. British Institution of Radio Engineers, West Midlands Section. "Industrial Applications of Automatic Control using Electronic Techniques," by R. J. F. Howard.

**Bristol.**—Assize Court Hotel, 6 for 6.30 p.m. Engineers' Guild, Western Branch. Annual general meeting.

School of Management Studies, Unity Street, 7 p.m. British Institution of Radio Engineers, South Western Section. "Radio Aids for Automatic Landing developed by the Blind Landing Experimental Unit," by J. S. Shayler.

**Knutsford.**—Lostock Alkali Social Club, Lostock Gralam, 6.30 p.m. I.E.E. North Western Centre. "Electricity in the Manufacture of Hydrogen Peroxide," by B. E. A. Vigers and R. O. Fletcher.

**Leicester.**—A.E.I. Lamp & Lighting Co., Ltd., Melton Road, 5.45 for 6.15 p.m. I.E.S. Leicester Branch. "Light Sources and their Applications," by H. R. Ruff.

**Port Talbot.**—Steel Company of Wales, Ltd., 5.30 p.m. Society of Instrument Technology, South Wales Section. "The Automatic Control of Rolling Mills," by W. N. Jenkins.

**Rugby.**—College of Engineering Technology, 6.30 p.m. I.E.E. Rugby Sub-Centre and Rugby Engineering Society. "Water Turbine-Driven Induction Generators," by C. L. C. Allan.

**Sheffield.**—British Iron and Steel Research Association Building, Hoyle Street, 7.15 p.m. Institute of Marine Engineers, North Midlands Section. "The Care and Maintenance of High Pressure Water-tube Boilers," by W. R. Harvey.

**WEDNESDAY, 26th OCTOBER, to THURSDAY, 27th OCTOBER**

**London.**—School of Pharmacy, Brunswick Square, W.C.1. Symposium on New Components organised by the British Institution of Radio Engineers.

**THURSDAY, 27th OCTOBER**

**Belfast.**—Central Hall, Rosemary Street. A.S.E.E. Northern Ireland Centre. "Protection Equipment for Industrial Plant," by Dr. W. L. Stern.

**Brighton.**—Technical College, 6.30 p.m. I.E.E. Southern Centre Graduate and Student Meeting. "Gramophone Pick-Ups for Stereo and Mono Reproducers," by D. J. Edwards.

**Croydon.**—Greyhound Hotel, High Street, 8 p.m. A.S.E.E. South London Branch. "Industrial Applications of Isotopes," by T. B. Rowley.

**Dundee.**—Electrical Engineering Department, Queen's College, 7 p.m. I.E.E. North Scotland Sub-Centre. Chairman's address by L. F. Dorward.

**Durham.**—Three Tuns Hotel, 7 p.m. Institution of Plant Engineers, North East Branch. "Inventions, Patents and the Engineer," by C. P. McCarthy.

**Harwell.**—Reactor School, A.E.R.E., 5.45 p.m. A.S.E.E. Oxford and Districts Branch. "Interference Suppression in Industrial and Research Establishments," by A. C. F. Leadbitter.

**Liverpool.**—Exchange Hotel, 7.15 p.m. Institution of Plant Engineers, Merseyside

and North Wales Branch. "On-Load Water Washing of Economisers and their Heaters," by R. Sheen.

**London.**—Savoy Place, W.C.2, 5 for 5.30 p.m. Institution of Electrical Engineers. "The Principles and Operation of Large Radio Telescopes," by Dr. A. Hewish.

Connaught Rooms, W.C.2, 12.30 for 12.55 p.m. Batti-Wallahs' Society. Luncheon.

**Maidstone.**—Star Hotel. Association of Supervising Electrical Engineers, Kent Branch. Combined East/West Kent Branch dinner.

**Sheffield.**—Wharncliffe Room, Grand Hotel, 7 p.m. Royal Statistical Society, Sheffield Group. "New Uses of Computers in Statistics," by Professor G. A. Barnard.

Grand Hotel, 7.30 p.m. Institution of Plant Engineers, Sheffield and District Branch. "The Consultant and Personnel Management," by T. H. Hawkins.

**Southampton.**—Polygon Hotel, 7.30 p.m. A.S.E.E. Southampton Branch and Electrical Contractors' Association. Joint meeting.

**Wirral.**—Associated Ethyl Co., Ltd., Oil Sites Road, Ellesmere Port, 7 p.m. Society of Instrument Technology, Chester Section. "Analogue Computers," by W. E. Willison.

**FRIDAY, 28th OCTOBER**

**Aberdeen.**—Robert Gordon's Technical College, 7.30 p.m. I.E.E. North Scotland Sub-Centre. Chairman's address by L. F. Dorward.

**Birmingham.**—Pavilion Suite, County Ground, Edgbaston. Electrical Trades' Commercial Travellers' Association, Midlands Branch. Annual dinner.

**Cheltenham.**—Queen's Hotel. E.I.B.A. Gloucester Branch. Ball.

Belle Vue Hotel, 7.30 p.m. Society of Instrument Technology, Cheltenham Section. "The Atomic Clock," by Dr. L. Essen.

**Coventry.**—E.M.E.B. Sports and Social Club, Merrick Lodge, Sandy Lane, 8 p.m. A.S.E.E. Coventry and District Branch. "Technical Education for the Electrical Engineer," by M. M. Robins.

**SATURDAY, 29th OCTOBER**

**Bradford.**—Great Northern Hotel, Bridge Street, 7 for 7.30 p.m. A.S.E.E. Bradford and District Branch. Annual dinner.

**Teddington.**—National Physical Laboratory, 10 a.m. A.S.E.E. Visit.

**TRADE MARKS**

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered up to 12th November:-

**Métropole.** No. 801,431. Class 7. Washing machines.—Laden S.A., Paris. Address for service: H. D. Fitzpatrick & Co., 94, Hope Street, Glasgow, C.2.

**Score.** No. 800,345. Class 9. Scientific, electrical and control apparatus and instruments, etc.—Elliott Brothers (London), Ltd., Century Works, Lewisham, S.E.13.

**Rotoshine.** No. B801,657. Class 9. Electric domestic polishing machines.—Pye, Ltd., Radio Works, St. Andrew's Road, Cambridge.

**Emicon.** No. 801,835. Class 9. Scientific and electrical apparatus and instruments, etc.—E.M.I. Electronics, Ltd., Blyth Road, Hayes, Middx.

**Comparatron.** No. 802,001. Class 9. Electronic test equipment for measuring or comparing two electrical quantities.—Mech-Test, Ltd., The Lye, St. Johns, Woking, Surrey.

**Slumberland.** No. 801,848. Class 10. Electric blankets, parts and fittings.—Slumberland, Ltd., Redfern Road, Tyseley, Birmingham.

# CONTRACT INFORMATION

## Accepted Tenders and Prospective Electrical Work

### CONTRACTS OPEN

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses

**Australia.**—Director, G.P.O. Stores and Contracts, Melbourne. 1st December. Switchboards and relay sets. (E.S.B. 26901/60.)\* 17th January. Coloured telephones and components. (E.S.B. 26933/60.)\* Department of Electricity, Brisbane. 2nd December. Two 30 MVA, 110/33 kV transformers. (E.S.B. 26962/60.)\* Victorian Railways, Melbourne. 2nd November. Switch circuit controllers. (E.S.B. 26935/60.)\* D.C. neutral line and track relays. (E.S.B. 26934/60.)\*

**British West Indies.**—Trinidad and Tobago Electricity Commission. 2nd December. Distribution transformers. (E.S.B. 27112/60.)\*

**Canada.**—Saskatchewan Power Corporation. 15th November. Double circuit steel transmission line structures. (E.S.B. 26643/60.)\*

**Ceylon.**—Ministry of Agriculture, Land Irrigation and Power, Colombo. 1st November. Control room air conditioning plants. (E.S.B. 26494/60.)\* 8th November. Generating sets for Kataragama, Imaduwa and Galle. (E.S.B. 26490/60.)\* 27th December. 33 kV transmission lines. (E.S.B. 26492/60.)\*

**Colombia.**—Bogota Electricity Company. 13th December. Construction of 33 MW power station near Tocancipa. (E.S.B. 26927/60.)\*

**Costa Rica.**—4th January. Electrical supplies for diesel generating station at La Colima. (E.S.B. 26624/60.)\*

**Edinburgh.**—Corporation. 14th November. Telephone exchange, City Chambers. (See this issue.)

**Egypt.**—State Railways. 9th and 16th January. Diesel trains. (E.S.B. 26424 and 26425/60.)\*

**Formosa.**—Central Trust of China. 11th November. Telephone cable. (E.S.B. 26467/60/I.C.A.)\* Shihmen Development Commission. 15th November. Equipment including two three-phase power transformers. (E.S.B. 26482/60/D.L.F.)\*

**India.**—U.P. State Electricity Board, Lucknow. 2nd January. 132 kV single-circuit transmission line. (E.S.B. 26484/60.)\*

Assam State Electricity Board. 7th November. 11 kV power cables. (E.S.B. 26673/60.)\* 30th November. 250 kVA transformers. (E.S.B. 26676/60.)\* 5th December. 125 V battery banks, charging sets and d.c. control boards. (E.S.B. 26672/60.)\*

Atomic Energy Establishment, Trombay. 1st November. Diesel generating set. (E.S.B. 26636/60.)\*

Chittaranjan Locomotive Works. 7th November. Electric overhead travelling crane and semi-Goliath cranes. (E.S.B. 26677/60.)\*

**Iran.**—General Customs Administration, Teheran. 17th November. Thirty battery-operated lift trucks. (E.S.B. 26669/60.)\*

**Longbenton.**—U.D.C. 5th November. Sodium street lighting. (See this issue.)

**New Zealand.**—Auckland Electric Power Board. 25th November. Two 12 MVA in-

coming switchgear equipments for transformer banks and twelve outgoing feeder equipments. (E.S.B. 26961/60.)\*

Franklin Electric Power Board. 8th November. 150 MVA, 11 kV, three-phase switchgear. (E.S.B. 26432/60.)\*

**Pakistan.**—Posts and Telegraphs Directorate. 16th November. Dry disc rectifiers. (E.S.B. 26651/60.)\*

Electricity, Water and Power Development Authority, Lahore. 1st November. Twin flat p.v.c. cable. (E.S.B. 26696/60.)\*

**St. Helens.**—Waterworks Department. 2nd November. Pumping plant for Carr Mill Dam industrial water scheme. E. K. Astin, water engineer, Tolver House, Tolver Street, St. Helens, Lancs.

**Sudan.**—Department of Stores and Equipment, Khartoum. 1st November. Twenty electric refrigerators. (E.S.B. 26629/60.)\* 28th November. Two 15 cu ft, 110 V d.c. refrigerators. (E.S.B. 26679/60.)\*

**Taunton.**—Borough Council. 31st October. Electrical goods for the year commencing 1st January, 1961. K. A. Horne, town clerk, Municipal Buildings.

**United States.**—Bureau of Reclamation, Denver. 1st November. Two power transformers. (E.S.B. 26481/60.)\*

Bonneville Power Administration, Portland, Oregon. 1st November. 3,700 suspension insulators. (E.S.B. 26623/60.)\*

**Whaley Bridge.**—U.D.C. 15th November. Class "A" street lighting installation. (See this issue.)

### WORK IN PROSPECT

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors

**Aberdeen.**—Out-patients' department (£152,000), Sick Children's Hospital; Regional Hospital Board, 1, Albyn Place.

**Andover.**—Houses (120), London Road; borough engineer.

**Aylesbury.**—College of Further Education, Oxford Road; county architect, County Offices, Walton Street.

**Barking.**—Flats (76), including a nine-storey block; borough architect, Town Hall.

**Basildon.**—Extensions to secondary school; Yorke, Rosenberg & Mardall, architects, 2, Hyde Park Place, London, W.2.

**Benfleet.**—Council offices (£80,000); Gerald Shenstone & Partners, architects, 34, Bloomsbury Way, London, W.C.1.

**Birmingham.**—Houses (42), Lower Shenley Farm estate; Bournville Village Trust, Oak Tree Lane, Birmingham, 30.

**Blaby (Leics.).**—Dwellings (92), during 1961; R.D.C. surveyor.

**Boldon (Co. Durham).**—Houses (50), North Road, Boldon Colliery, and 68 houses at Whitburn; J. T. Edmondson, U.D.C. surveyor, East Boldon.

**Bournemouth.**—Church of St. Katherine, Broadway; Jackson & Greenen, architects, Hinton Buildings, Hinton Road.

**Chelmsford.**—Works and offices; Essex Chronicle, Bradford Street.

**Bradford.**—Belle Vue Boys' Grammar / Technical School; Burnet, Tait & Partners, architects, 10, Bedford Square, London, W.C.1.

**Bristol.**—Flats (44), Great George Street; Miles & Wills, architects, 18, Great George Street.

**Harpden (Herts.).**—Flats (40), Oakley Road; surveyor, Harpenden Hall.

**Hastings.**—Flats (145), Grand Hotel site;

Thomas Sibthorp, architect, 10, Manchester Square, London, W.1.

**Leominster.**—Old people's bungalows (25), laundry, bedroom block, community centre and warden's flat, Sydonia site; H. Schofield, borough surveyor, Municipal Offices, Grange Court.

**London.**—Dwellings (157), Phipps Bridge estate, Merton Abbey; Collyatt & Hamp, architects, 86, Prince Albert Road, N.W.8.

Showrooms and offices, Southwark; Dispatch Motor Co., Ltd., 120, Southwark Bridge Road, S.E.1.

**Lytham St. Annes.**—Dwellings (86), Saltcotes Road; borough engineer, Town Hall.

**Mansfield.**—Showroom and offices, Padley Hill and Stockwell Gate; J. Bower, Ltd., 2, Padley Hill.

**Margate.**—Houses (73), Millmead Road estate; E. C. Harris & Partners, quantity surveyors, Lynton House, Tavistock Square, London, W.C.1.

**Milngavie (near Glasgow).**—Houses (30), Clober site; secretary, Scottish Special Housing Association, Ltd., 19, Palmerston Place, Edinburgh.

**Newcastle-on-Tyne.**—Extensions to the Students' Union and erection of new refectory at King's College (£400,000); W. Whitley, architect, 35a, Queensgate, London, S.W.7.

R.C. secondary modern school at Benwell Village; D. Brown, architect, 10, Lambton Road, Jesmond, Newcastle.

Factory additions, Water Street and Penn Street, for Austin Lifts, Ltd.; Tasker & Partners, architects, 25, New Bridge Street, Newcastle.

Showrooms, offices, etc., for St. Andrews Motors, Ltd.; M. & H. Gatoff, architects, 26, Mosley Street, Newcastle.

**Pickering (Yorks.).**—Police station, court house and weights and measures office; North Riding county architect, County Hall, Northallerton.

**St. Leonards-on-Sea.**—Three-storey showrooms and offices, 30/2, London Road; Timothy Whites & Taylors, 70, Vauxhall Bridge Road, London, S.W.1.

**Salford.**—Multi-storey block of administrative offices at the Crescent, for the Health Department; city engineer, Town Hall.

**Solihull.**—Shopping estate; Harry W. Weedon & Partners, architects, 45, Calthorpe Road, Birmingham.

**Treford.**—Tower blocks of flats, Cornbrook Park Road area; borough engineer.

**Sunderland.**—R.C. church, Hylton; Stienlet & Son, architects, 4, Queen Square, Newcastle-on-Tyne.

**Theford.**—Block of nine-unit factories, industrial estate; borough engineer, Guildhall, Thetford, Norfolk.

**Tipton.**—Flats (48), St. John's Road; borough engineer.

**Tynemouth.**—Proposed redevelopment scheme comprising three-storey block of six shops and six maisonettes, and two blocks of 12 flats and 14 maisonettes; borough engineer, 16, Northumberland Square, North Shields.

**Walthamstow.**—Extension (£58,000), Willowfield Girls' School; Tooley & Foster, architects, Midland Bank Chambers, Buckingham Hill.

**Wanstead.**—Blocks of multi-storey flats; borough engineer, Municipal Offices, High Road, Woodford, E.18.

**Weston-super-Mare.**—Two factories, Old-mixon industrial estate; R. G. Lickfold, town clerk, Town Hall.

**Whitley Bay.**—Indoor swimming pool (£165,000); E. Roberts, U.D.C. engineer.

**Wolverhampton.**—Health centre, Brooklands Parade; borough engineer.

\* This information is extracted from the Board of Trade Export Service Bulletin. Inquiries should be addressed to the Board of Trade, Export Services Branch, Lacon House, Theobald's Road, London, W.C.2 (Telephone: Chancery 4411, Ext. 738), quoting the reference given.



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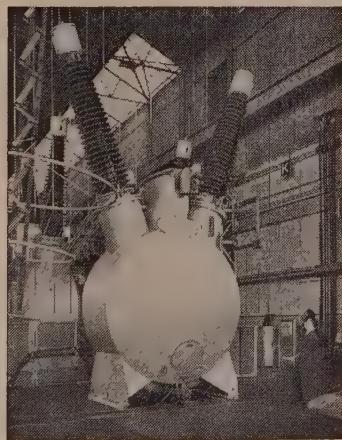
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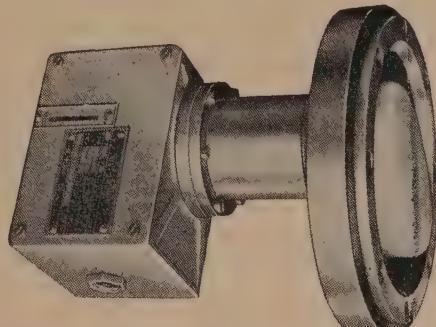
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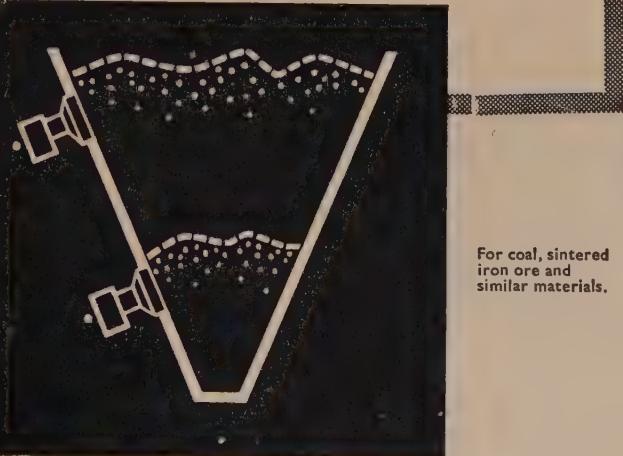
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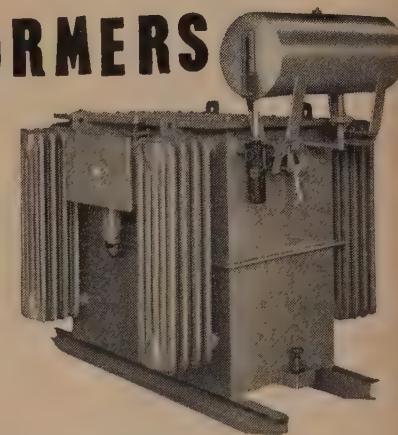
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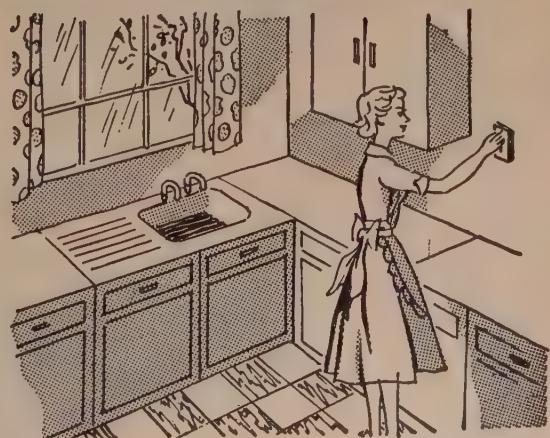
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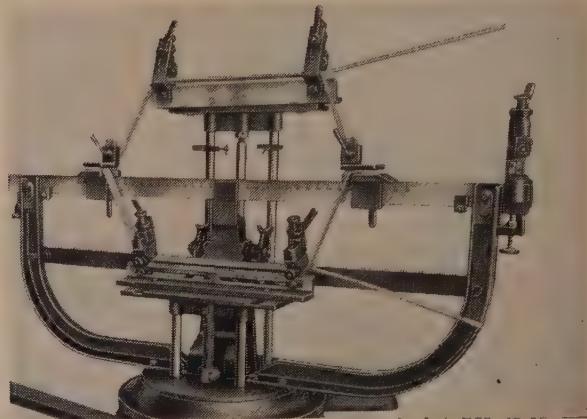
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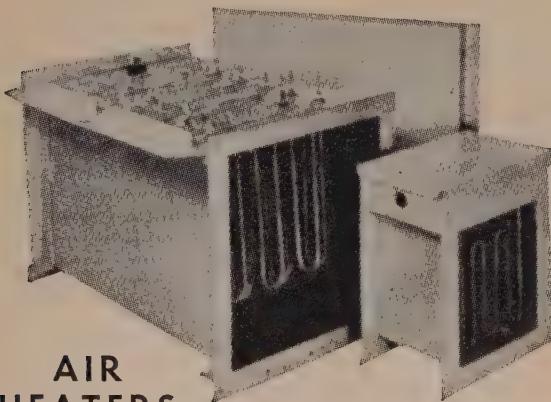
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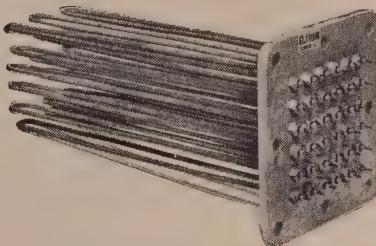
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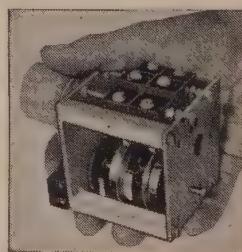
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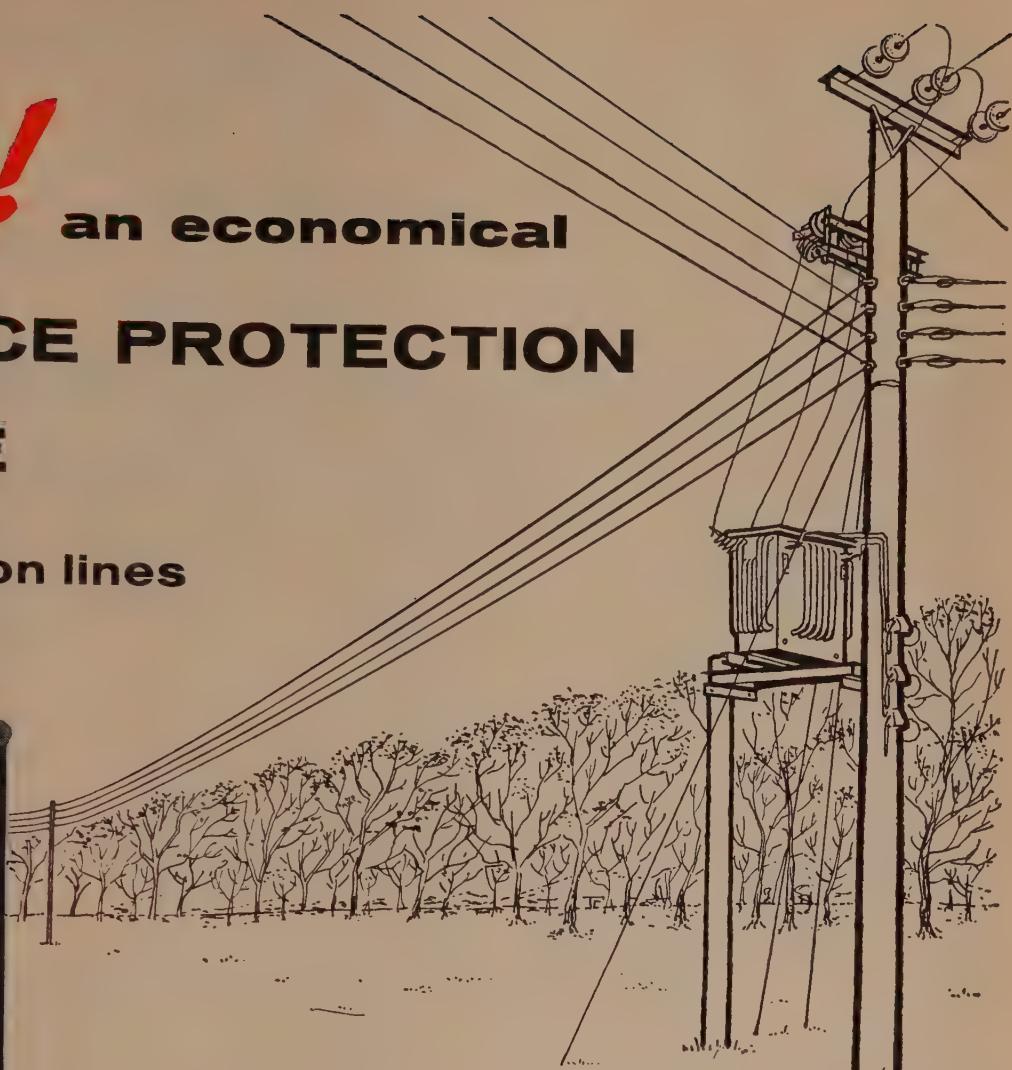
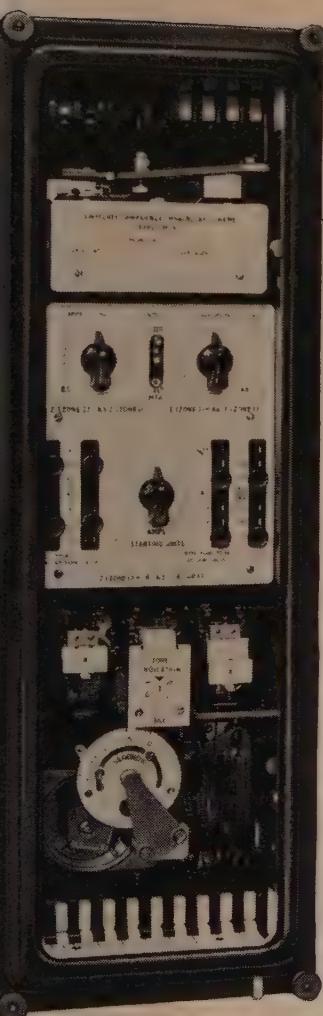
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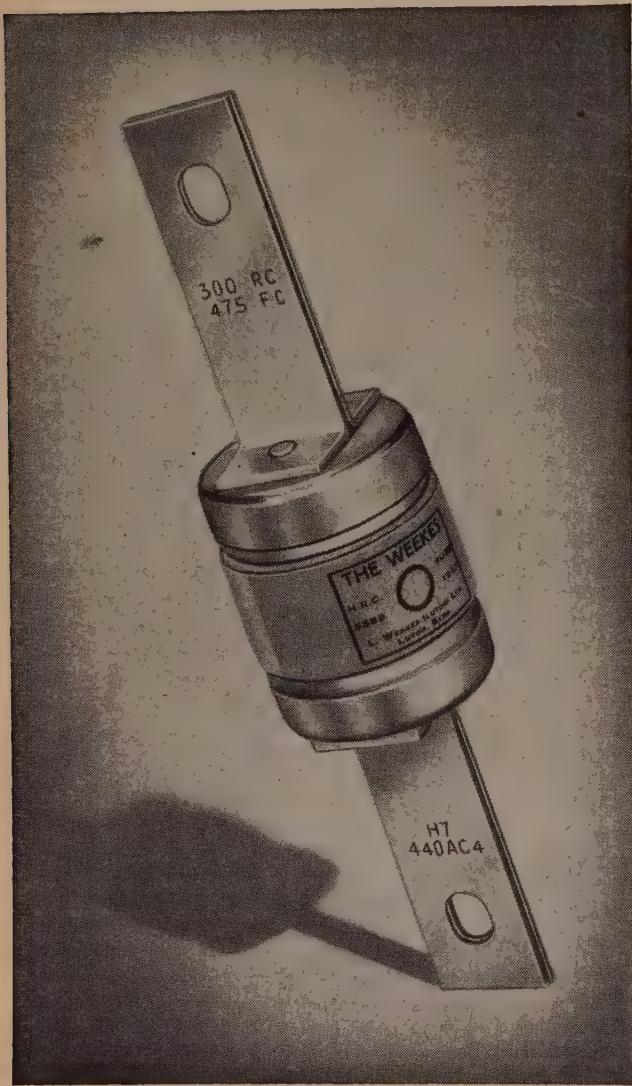
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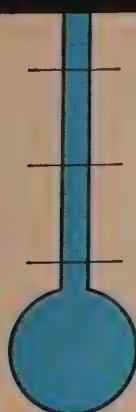
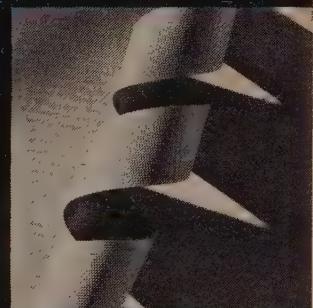
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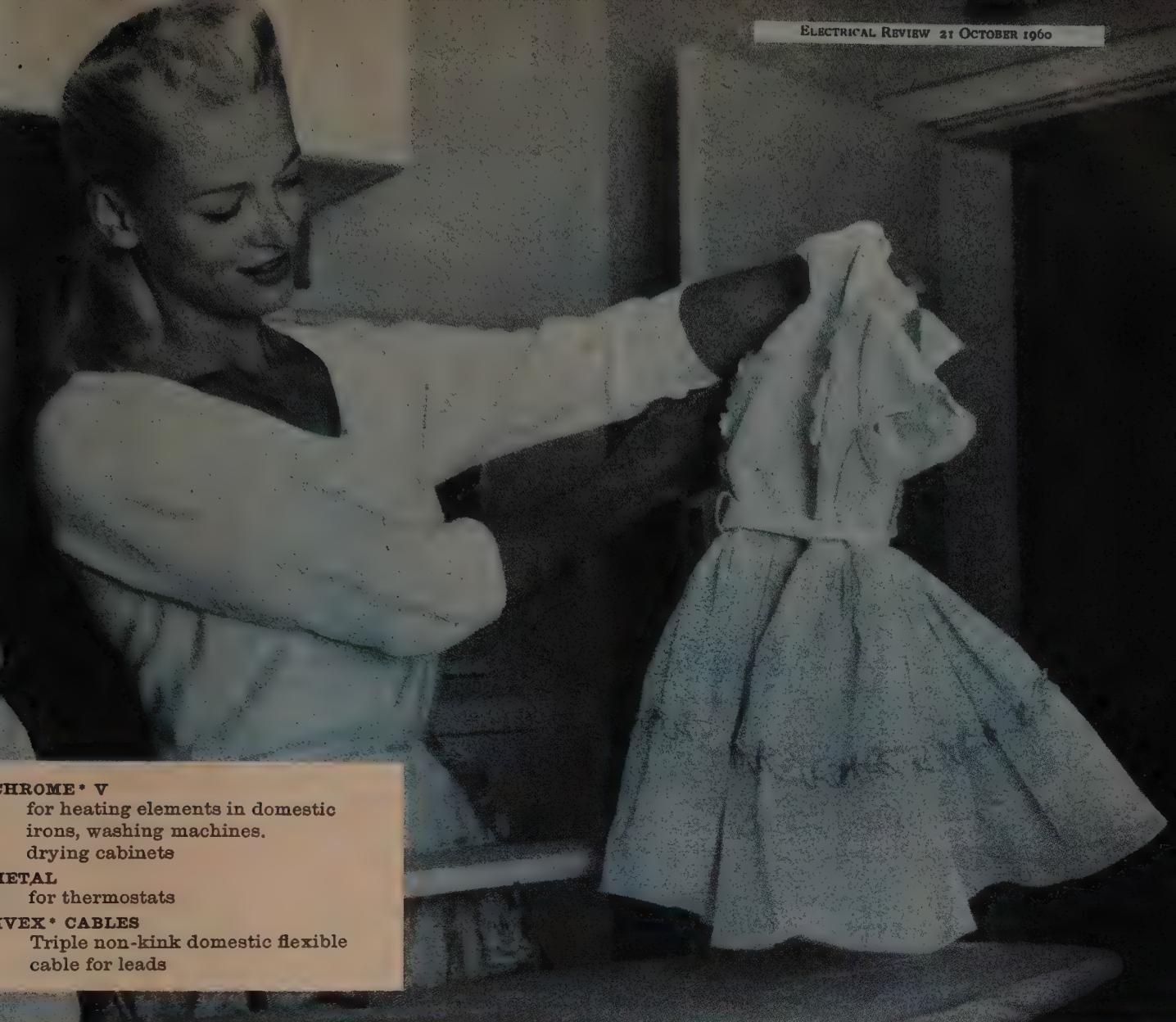
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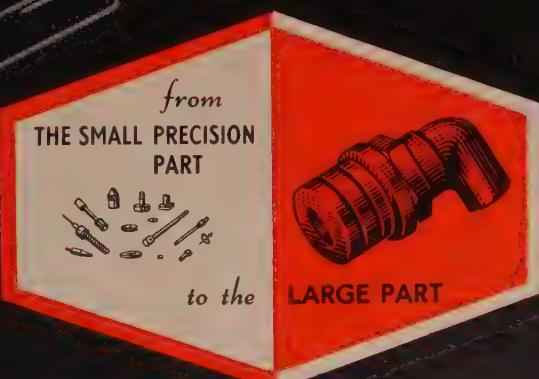


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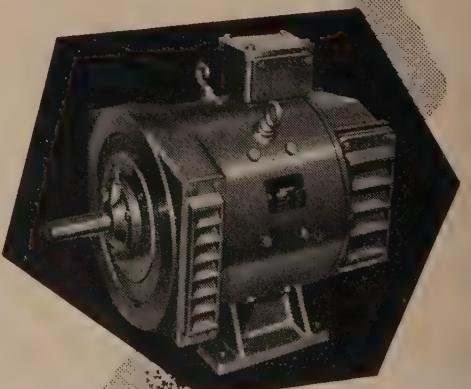
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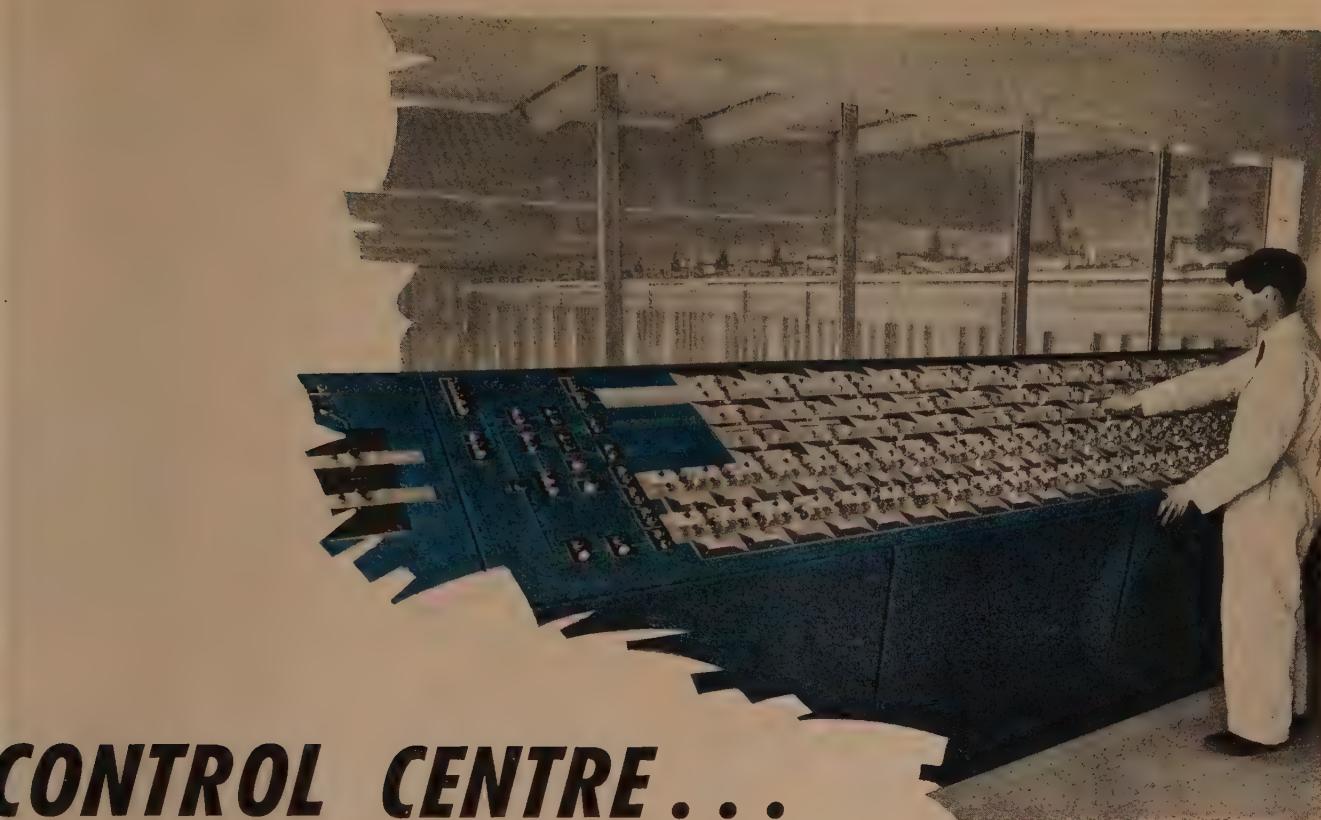
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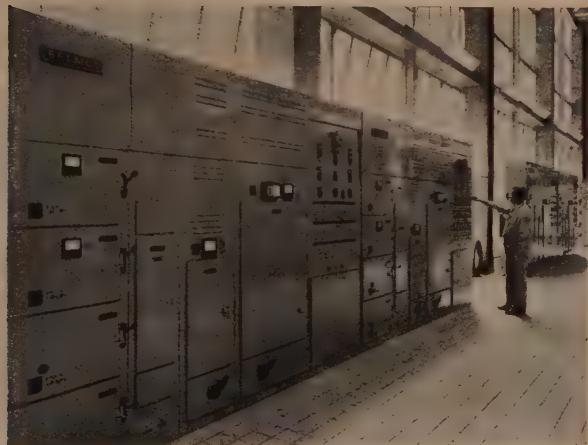
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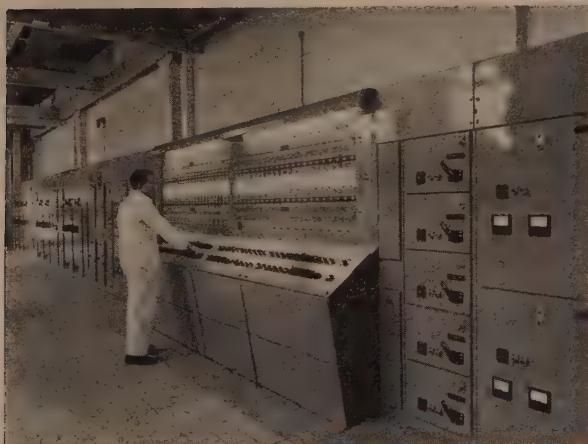
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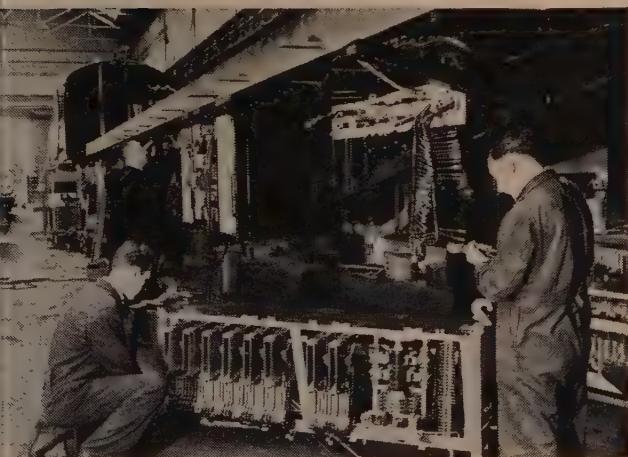
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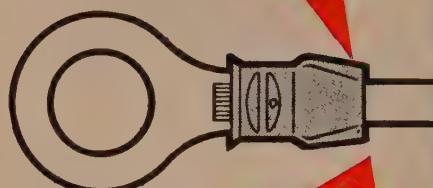


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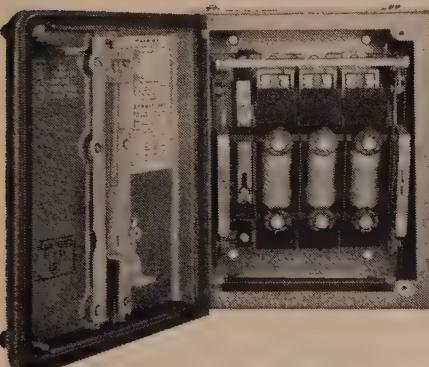
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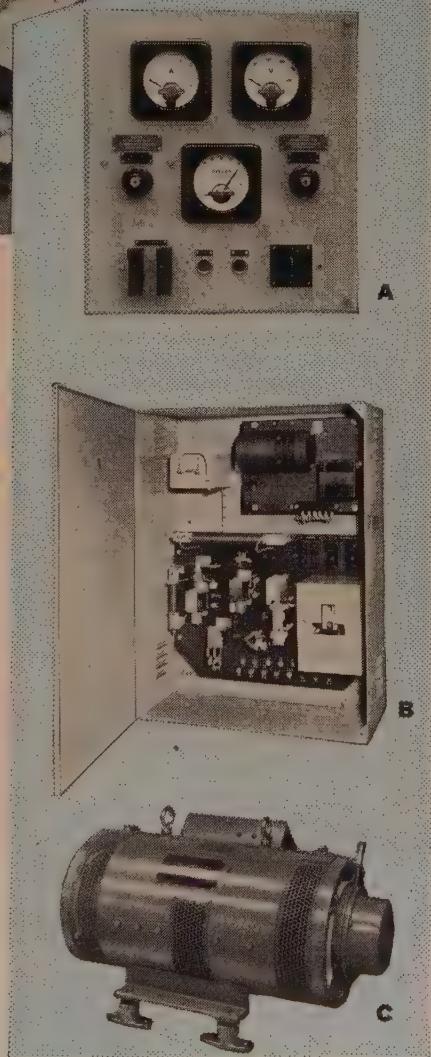
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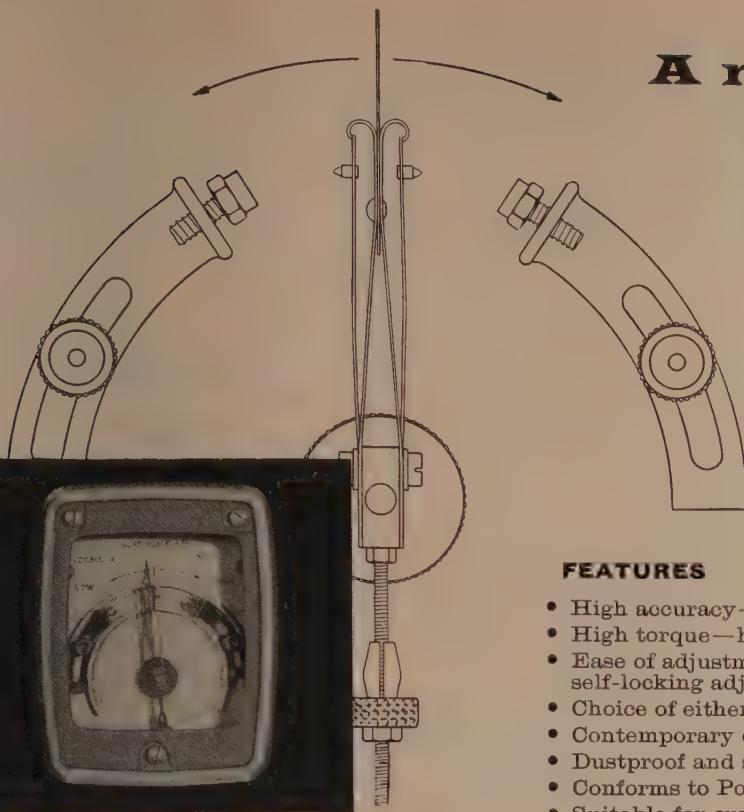


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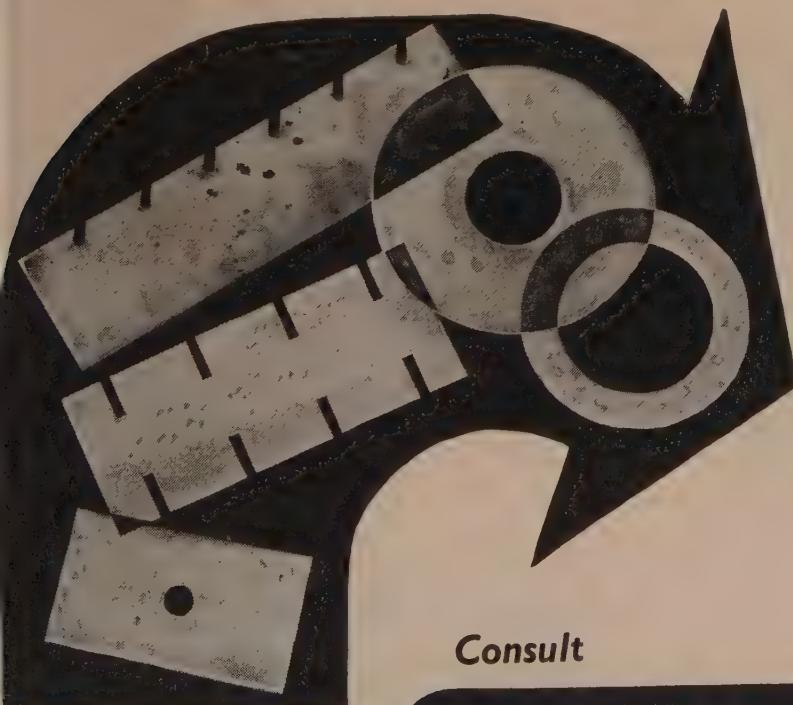
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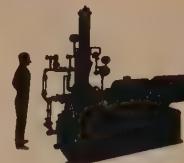
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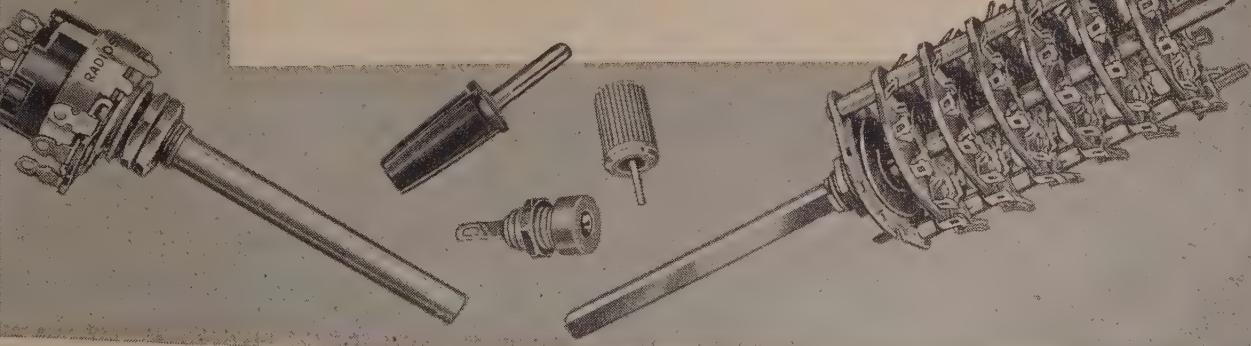


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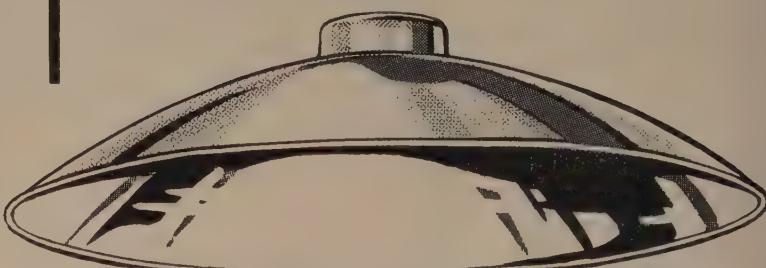
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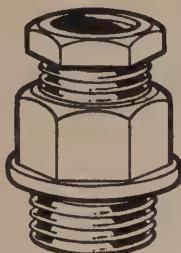
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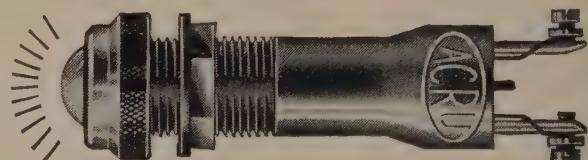
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Used by most Electronic and Electrical Manufacturers throughout the world. Supplied with one-hole fixing. Average life 25,000 hours. There are over twenty-five models. Voltages from 60 to 440.

Ask for details of our new S.E.S. and M.C.C. fittings.

**ACRU ELECTRIC TOOL MFG. CO. LTD.**

Acrum Works, Demmings Road, Councillor Lane, Cheadle, Cheshire. Tel.: Gatley 6058

## "BARLECTA"

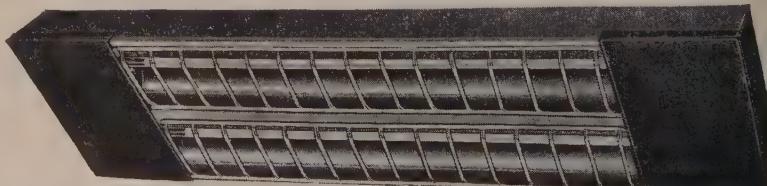
STOP/START SWITCHES, FIRE  
 ALARMS, LIMIT SWITCHES, Etc.



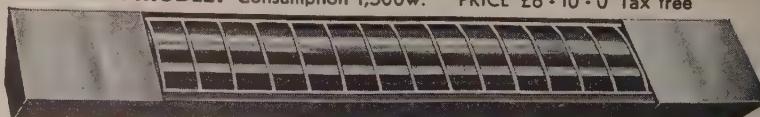
Ask for List No.  
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We can quote for  
 FRACTIONAL H.P.  
 MOTORS against  
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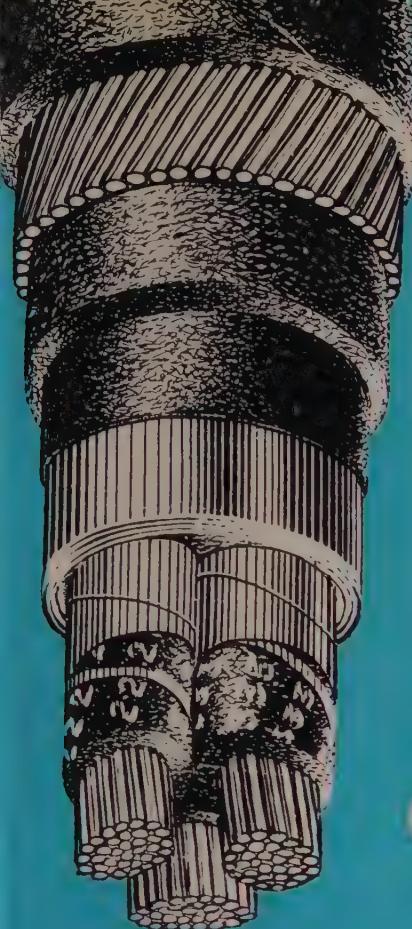
**BARRIES ELECTRICAL AGENCIES, LTD.**  
 KEMP TOWN, BRIGHTON 7



**TWIN MODEL:** Consumption 1,500w. PRICE £6-10-0 Tax free



**SINGLE MODEL:** Consumption 750w. PRICE £3-15-0 Tax free  
 TRADE PRICES ON APPLICATION



## GLOVERS TODAY

### the mains and mining cable people

Today our organisation is fully engaged in the production of mains cables for power transmission and distribution for the electrical and mining industries.

Today the manufacturing 'know how' and technical knowledge gained over nearly a century of cable making is being applied in the development and production of all types of power cables. For over fifty years Grovers unique non-draining paper insulated cables have been solving the compound migration problems of supply engineers throughout the world. Today also Grovers are playing a prominent part in the growing development of plastic mains systems.

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From the smallest, brightly coloured clock flexibles to tough rubber-sheathed industrial cables, AEI Cable Division has them all—V.R. or P.V.C. insulated. This yellow and black reel, symbol of the combined resources of Henley Cables, Liverpool Cables and Siemens Ediswan, is the newest container for AEI flexible cords. It is your assurance of the most comprehensive range of quality flexibles in the world. AEI flexible cords are available through 50 sales outlets throughout the country. You can rely on AEI

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## CABLE DIVISION

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*Cables Sales Department*

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## TERMINAL BLOCKS



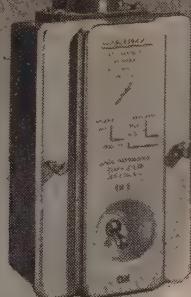
Full ranges  
up to 12-way  
From 5 amp.  
to 50 amp.

*Litholite*  
Plastic Moulders  
since 1901

LITHOLITE Insulators & St. Albans MOULDINGS LTD.  
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## Low Voltage LIGHTING TRANSFORMER

With 1, 2 or 3  
Arm Brackets



Weatherproof • Aluminium Casing  
D.P. On-Off Switch • Primary and  
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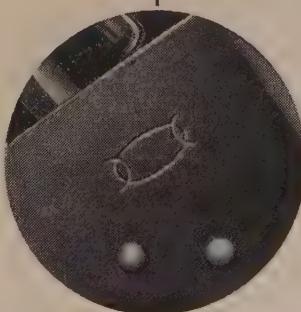
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(ENGINEERS) LTD**



BELLCRAG WORKS • DALSHOLM ROAD • GLASGOW N.W.  
Tel: MARYhill 3315 6



They may  
**LOOK** alike  
but look a  
little closer



**ONLY** genuine  
'MORGANITE' Brush  
Holders have the  
familiar link trade  
mark—and don't  
forget we make  
controller parts and  
contacts too.

**MORGANS**

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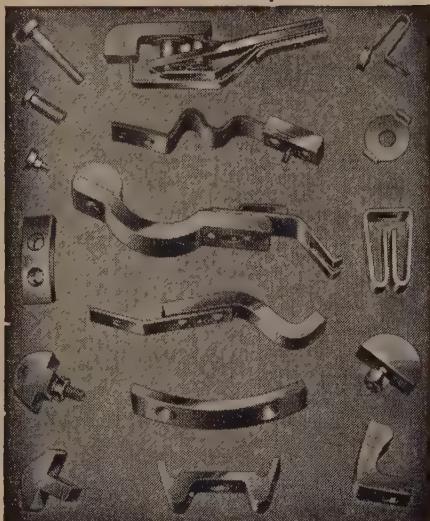
CUMBERLAND ROAD, STANMORE, MIDDLESEX  
GD 453 Tel: Wordsworth 0055 & 0058

## CONTACTS

for  
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or  
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A DOZEN  
OR A  
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A.I.D. Approved



Contacts for every electrical purpose in any metal. Switch and Control Gear spares for every type of British or Foreign Gear. Any Quantity. We supply hundreds of maintenance electrical engineers and switchgear manufacturers throughout the world.



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**126 MILLION TIMES  
SO FAR WITHOUT ATTENTION**

BLEECO  
FLASHERS  
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CROSSINGS  
ARE AS  
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**BLEECO LTD**

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BRIGHTON 7

# Mercury switches

THE MERCURY SWITCH MANUFACTURING COMPANY LIMITED are the largest specialised manufacturers of Mercury Switches in Great Britain. These are made to exceptionally high and uniform standards of quality. Since its inception in 1932, this Company has concentrated solely on the production of Mercury Switches. It has thereby obtained the widest possible experience and expert knowledge of design manufacture and application.

THE MERCURY SWITCH  
MANUFACTURING COMPANY LIMITED  
WEST DRAYTON + MIDDLESEX  
West Drayton 3157

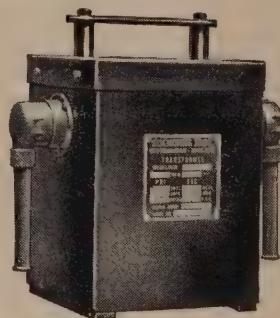
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## VOLTAGE DROPPING TRANSFORMERS

For Electric Tools on  
110 volts

Full range of fixed and  
portable types in all  
capacities, or made to  
specification. List free.

**SIMMONDS BROS.  
STOURBRIDGE**



**If you need**

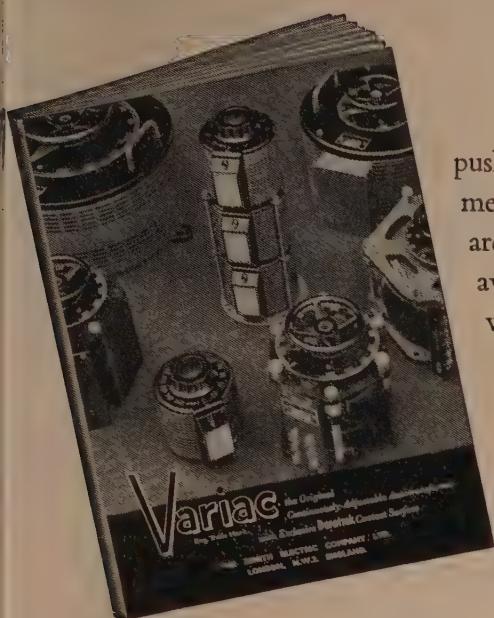
a small **METAL PRESSING** for your  
product, why not consult us?

We specialise in light precision presswork  
in all metals for the Electrical Trades.

QUOTATIONS BY RETURN

**BIRMINGHAM SPECIALITIES LTD.**  
Moor Lane, Witton, Birmingham 6. Phone: BIRchfields 5026

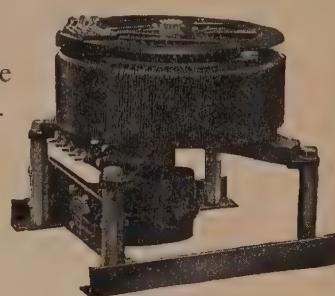
**ZENITH**  
Reg. Trade Mark



**Variac**  
Reg. Trade Mark

*the  
original  
continuously-adjustable  
autotransformer*

Another selection from our range, designed for remote control by push-button operation and suitable as a dimmer avoiding the losses met when resistances are used. Fully automatic arrangements are available—‘push’ to start, ‘push’ to stop—with an intermediate predetermined “dim” position if required. A range of motor speeds can be offered and also variable-speed motors with divertor for other applications. “VARIACS”, including ganged models, may be motorised for loads between 500 VA and 30 kVA.



MODEL 50-B-GD  
Output zero to 270 volts  
on 240 volts, 50 cycles,  
20 amperes rated current.

## THE ZENITH ELECTRIC COMPANY LTD.

ZENITH WORKS, VILLIERS ROAD, WILLESDEN GREEN, LONDON, N.W.2

Telephone : WILLESDEN 6581-5

Telegrams : Voltaohm, Norphone, London

MANUFACTURERS OF ELECTRICAL EQUIPMENT INCLUDING RADIO AND TELEVISION COMPONENTS

**Now Made in Great Britain —**

# DEAC

PERMA-SEAL  
SEALED RECHARGEABLE

NICKEL CADMIUM CELLS & BATTERIES



No corrosion - No gassing - No maintenance - Unlimited shelf life  
Robust and compact - From 20 mAh to 23 Ah

For Radios, Hearing-aids, Tape Recorders, Shavers, Torches, Electric Toys, Portable Measuring Instruments



*All enquiries to the sole Distributors*

**G. A. STANLEY PALMER LIMITED**

Maxwell House, Arundel Street, London, W.C.2  
Tel 3721



**NEW!**

*Nail DIRECT INTO PLASTER, BRICK, BREEZE or LIGHT CONCRETE!*

**NO DRILLING OR PLUGGING**

"OBO" Fixing Pins have been specially designed for the electrical Trade and are most suitable for fixing cable clips.

**IMPORTANT**

For fixing clips direct to concrete, brick or breeze  $\frac{1}{4}$ " pins must be used but if materials are overlaid with plaster a  $\frac{1}{8}$ " pin must be used.

$\frac{1}{4}$ " PINS: 2/9 per gross. 16/6 per 1000 } All prices  
 $\frac{1}{8}$ " PINS: 3/2 " " 19/6 " 1000 } Carriage paid

## DEVON PAINTS LTD.

39a, High Street

BARNSTAPLE . DEVON

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## ELECTROSPRAY

A.R.B. APPROVED

### THE ANTI-TRACKING ANTI-CORROSION AGENT

In areas which are prone to condensation and corrosion, electrical equipment tends to suffer from tracking and (in common with other equipment) corrosive decay. A special phenyl-methyl silicone fluid in aerosol containers is now available which, by fine spray, places an even coating over faces being treated. This film is completely water-repellent and also prevents corrosion over a long period of time.

Highly resistant to oxidation and with a high flash point and low volatility, Ambersil Electrospray—available only from the producers—is marketed at:—19/6d. per aerosol.

OVERSEAS AGENCIES  
AVAILABLE

AMBER OILS LTD., 11a, ALBEMARLE STREET, LONDON, W.1  
Mayfair 6161/3



JUST A  
LITTLE  
SQUIRT  
and Ambersil  
Electrospray  
does the rest

**H.C.  
COPPER  
WIRES  
ENAMELLED  
on L.T.V. REELS**

**F.D.  
SIMS  
LIMITED**

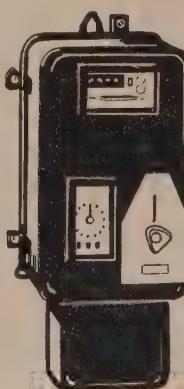
... a product of

H.C. COPPER WIRE  
SIZE 29/0136"  
COATED ENAMEL 55.50IDS  
F.D.SIMS LTD., HAZELHURST WORKS, RAMSBOTTOM,  
Lancashire, England. Tel: RAMSBOTTOM 2213/4/5.

P.O. Box 8, Hazelhurst Works, RAMSBOTTOM, via Bury, Lancs.  
Telephone: Ramsbottom 2213/4/5. Telegrams: "SIMS" Ramsbottom.

London Office and Stores:  
106 Newlands Park, Sydenham, London, S.E.26. Telephone: SYDenham 4211/2

S57



## PREPAYMENT METERS

RECONDITIONED  
& GUARANTEED

FACTORY RECONDITIONED AND FULLY  
TESTED. 2-YEAR GUARANTEE. SINGLE  
AND POLYPHASE CREDIT METERS

Supplied to Contractors, Local Authorities &  
Public Undertakings throughout the U.K.

## TELEVISION SLOTMETERS

SPECIALLY DESIGNED AND MANUFACTURED  
FOR "PAY-AS-YOU-VIEW" TELEVISION.

**ALBERICE METER CO.**  
87/89 STERTE AVENUE, POOLE,  
DORSET  
POOLE 272

London Office & Depot: 371, West Green Road, TOTTENHAM, N.15. Bowes Park 7080

## ALLEN-BRADLEY

MOTOR



CONTROL

consult  
**KEMPSTON ELECTRICAL CO. LTD.**  
KEMPSTON, BEDFORD. Phone: Kempston 2358/9



## ADD-ON HEATING UNITS NOW AVAILABLE

in 2, 3, 4 and 5ft lengths at 18/6 per foot  
tax inclusive

Tailored to fit ANYWHERE  
Low Consumption Silica Glass tube element  
(60W per linear ft.)

We invite your enquiries

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Regd. Office: 1 BRUCE AVENUE, SHEPPERTON  
MDDSX. Telephone: Walton-on-Thames 25661

Works: FARNBOROUGH, HANTS



### WORLD FAMOUS FRACTIONAL HORSE-POWER GEARED MOTORS

Output-shaft has 12 positions.  
Integral Wormgear Reduction.  
Ventilated—Drip Proof.  
Vacuum Impregnated Windings.  
Dynamically balanced Armatures and Rotors.



#### SERIES WOUND GEARED MOTOR—Type 'K'

R.P.M.	TORQUE	R.P.M.	TORQUE
600	10 oz. in.	37.5	4 lb. in.
300	16 oz. in.	25	4 lb. in.
150	24 oz. in.	18.8	4 lb. in.
100	32 oz. in.	12.5	4 lb. in.
75	36 oz. in.	9.4	4 lb. in.
50	3 lb. in.	6.25	4 lb. in.

#### SHADED-POLE INDUCTION GEARED MOTOR—Type 'FA'

R.P.M.	TORQUE	R.P.M.	TORQUE
216	4 oz. in.	13.5	24 oz. in.
108	7 oz. in.	9	30 oz. in.
54	10 oz. in.	6.7	35 oz. in.
36	12 oz. in.	4.5	44 oz. in.
27	15 oz. in.	3.35	3 lb. in.
18	20 oz. in.	2.25	4 lb. in.

#### VARIABLE SPEED GEARED MOTOR—Type 'KQ'

R.P.M.	TORQUE	R.P.M.	TORQUE
200-600	9 oz. in.	12-37.5	4 lb. in.
100-300	16 oz. in.	8-22	4 lb. in.
50-150	20 oz. in.	6-16.5	4 lb. in.
32-100	32 oz. in.	4-11	4 lb. in.
25-75	40 oz. in.	3-8.25	4 lb. in.
16-50	48 oz. in.	2-5.5	4 lb. in.

#### CAPACITOR INDUCTION GEARED MOTOR—Type 'N'

R.P.M.	TORQUE	R.P.M.	TORQUE
456	8 oz. in.	28.5	3 lb. in.
228	13 oz. in.	19	4 lb. in.
114	21 oz. in.	14.2	4 lb. in.
76	26 oz. in.	9.5	4 lb. in.
57	32 oz. in.	7.1	4 lb. in.
38	44 oz. in.	4.75	4 lb. in.

### CITENCO LIMITED

MANOR WAY - BOREHAMWOOD

Telegrams: Citenco Borehamwood

HERTS - ENGLAND

Telephone: Elstree 3666-7-8

*Are you complying with  
the REVISED FACTORY  
REGULATIONS?*

Revised regulations regarding First Aid in Factories are effective from 1st January 1960.

As the Pioneers of Industrial First Aid we offer approved complete First Aid Outfits to meet the requirements of all trades.

Please state number of employees and nature of business when ordering.

Full details are available to responsible officials applying on their company's letterhead, mentioning this "Electrical Review" announcement.

## CUXSON, GERRARD & CO. LTD.

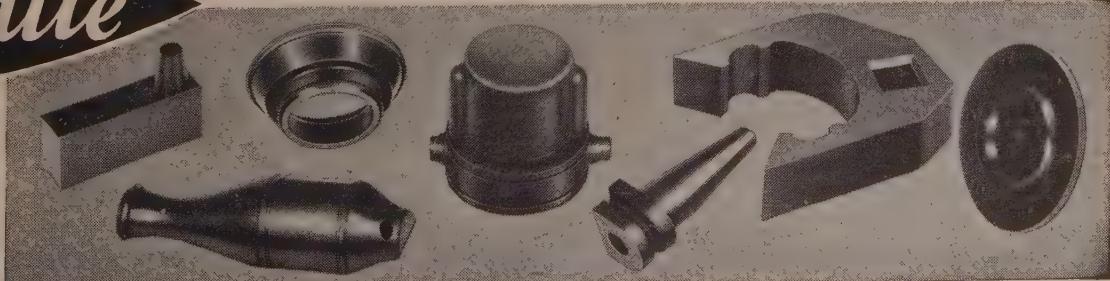
OLDBURY, BIRMINGHAM

Telephone: BROADWELL 1355 (4 lines)

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SPECIALISTS  
IN RUBBER  
MOULDINGS  
FOR OVER  
60 YEARS

## MOULDED RUBBERS SERVICE



THE HARBORO' RUBBER CO. LTD., MARKET HARBOROUGH. TEL: 2274/5/6.

**Aeroflex**

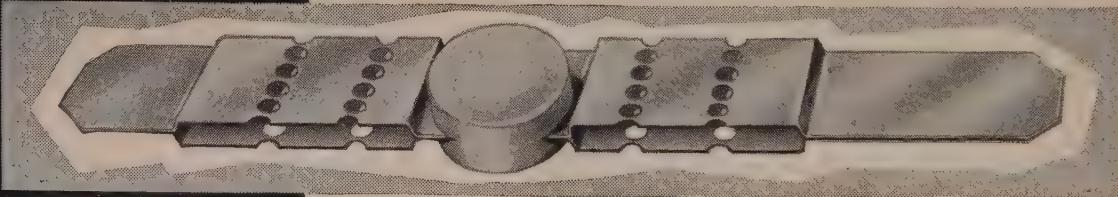
# FUSE-LINKS

*have ALL the advantages*

- Aeroflex H.B.C. Fuse-Links were first produced in 1923. They are backed by the experience of 37 years of progress.
- Technically the performance of Aeroflex Fuse-Links
- transcends the requirements of the appropriate British Standard Specifications.
- The range covers all requirements for fuse units, distribution boards and fuse boxes, fuse switches and switch fuses, for both industrial and flameproof applications.
- When blown, they are not discarded but can be returned to our works for rewiring.
- They are made in sizes which are interchangeable with all leading makes.
- Their high breaking capacity ensures that the severest faults are disconnected noiselessly and instantaneously.
- The energy permitted to develop in a faulty circuit is a minute fraction of that which is admitted by conventional automatic protection.
- Aeroflex fuses protect electrical circuits against overloading.

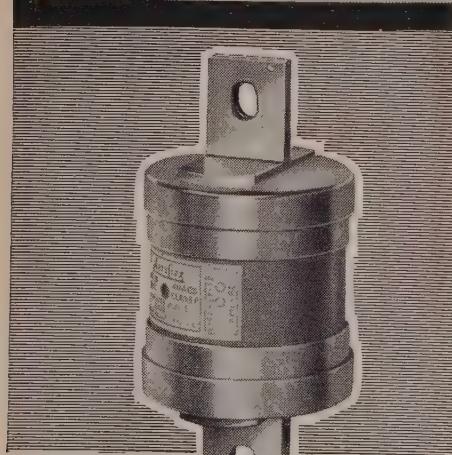
An Aeroflex type LDF  
300 amp Fuse first pro-  
duced in 1923.

THE CHARACTERISTICS OF AEROFLEX FUSE-LINKS RENDER IT UNNECESSARY TO INSTALL GEAR MUCH LARGER THAN THE RATED CURRENT REQUIRES. OVER-FUSING IS UNNECESSARY.



*and now, the new UNILAG range of Fuse-Links  
advances the name of AEROFLEX:—*

- in 30 amp to 400 amp sizes
- to B.S.88 Cat. 440 AC5
- appendix J dimensions
- reliable non-explosive indicators
- rewireability by our prompt factory service
- class P characteristics (fusing factor not exceeding 1.25)
- underwirings available down to 5 amp



A modern Aeroflex  
Unilag type FB3 300  
amp Fuse to the same  
scale as the illustra-  
tion above.

**Parmiter Hope & Sugden Ltd**

FLUVENT ELECTRICAL WORKS · LONGSIGHT · MANCHESTER 12.

London: 34 Victoria Street, S.W.1. Glasgow: 5 Somerset Place, C.3. Birmingham: 39/41 Carrs Lane, 4.

# Classified Advertisements

**CLASSIFIED** advertisements are PREPAID at 3/6 per line (approx. 6 words).

**DISPLAYED CLASSIFIED**—4/- per single column inch.

Where an advertisement includes a Box Number there is an additional charge of 1/-.

**SERIES DISCOUNTS** for consecutive insertions:—13, 5%; 26, 10%; 52, 15%.

**SITUATIONS WANTED**—Three insertions under this heading can be obtained for the price of two if ordered and prepaid with the first insertion.

cheques and Postal Orders should be crossed and made payable to ELECTRICAL REVIEW PUBLICATIONS LTD.

**REPLIES TO BOX NUMBERS** should be addressed to the Box Number in the advertisement, 1/o ELECTRICAL REVIEW, Dorset House, Stamford Street, London, S.E.1. If an applicant for a situation appearing under a Box Number does not wish his reply to be forwarded to a particular firm or individual, instructions to this effect should be addressed to the Advertisement Supervisor, ELECTRICAL REVIEW. The name of an advertiser using a Box Number cannot be disclosed.

## OFFICIAL NOTICES, TENDERS, ETC.

### LONGBENTON URBAN DISTRICT COUNCIL

#### Public Street Lighting: Group II

TENDERS are invited for the supply and erection of 64 Sodium Vapour Street Lighting Units and 474 Post Top Lantern Filament Lighting Units.

The plans can be inspected at the office of the Engineer and Surveyor, and specification, schedule and form of tender can be obtained on application to Mr. A. E. Sweetman, M.I.Mun.E., Engineer and Surveyor, Council Offices, Forest Hall, Newcastle upon Tyne, 12, on payment of a deposit of £3 3s., returnable only on receipt of a bona fide tender not subsequently withdrawn and the return of all documents loaned.

Tenders in a plain sealed envelope endorsed "Public Street Lighting" must be delivered to the undersigned not later than the 5th November, 1960.

The Council do not bind themselves to accept the lowest or any tender and reserve the right to divide the contract should they so desire.

G. HARRISON,  
Council Offices,  
Forest Hall,  
Newcastle upon Tyne, 12.

6403

### BOROUGH OF WREXHAM

#### Electrical Installation

TENDERS are invited for:—

- (a) The Electrical Installation to 40 Dwellings on the Tanat Way and Sutton Drive Housing Sites.
- (b) The supply of Consumers' Units and Cabinets for 40 Dwellings.

Applications for tender forms and specifications should be made to the Borough Engineer and Surveyor, 31, Chester Street, Wrexham, where copies of the house plans may be inspected.

Competeted tenders must be returned to the undersigned in the envelope provided by not later than 12 noon, Monday, 31st October.

The Council does not bind itself to accept the lowest or any tender.

PHILIP J. WALTERS,  
Guildhall,  
Wrexham.

Town Clerk.

6319

### WALEY BRIDGE URBAN DISTRICT COUNCIL

#### Class "A" Street Lighting

TENDERS are invited for the supply and erection, complete with ancillary works, of 16 Class "A" Concrete Columns with Sodium Discharge Lanterns.

Specification, bill of quantities and form of tender may be obtained on application to the Surveyor, Council Offices, Whaley Bridge, Nr. Stockport.

Tenders in plain sealed envelopes endorsed "Class A Lighting" must be delivered to the undersigned not later than 12 noon on Tuesday, 15th November, 1960.

The Council do not bind themselves to accept the lowest or any tender.

C. HOUGH,  
Council Offices,  
Whaley Bridge,  
Nr. Stockport.  
13th October, 1960.

6418

### EDINBURGH CORPORATION

#### New Telephone Exchange for City Chambers

TENDERS will shortly be invited for the above P.A.B.X. Intending offerers should apply to the City Architect, City Chambers, Edinburgh, not later than 24th October, 1960.

Documents, etc., will be issued thereafter and are to be returned to the Town Clerk, signed and sealed in the official envelopes supplied, by noon on 14th November, 1960.

The Corporation shall not be bound to accept the lowest or any offer.

6394

### SITUATIONS VACANT

(See "Replies to Box Numbers" above)

### SURREY COUNTY COUNCIL

APPLICATIONS are invited for following appointments:—

GRADE SPECIAL: IV (£840-£1,310 p.a. plus £40/£45 p.a. London allowance).

ELECTRICAL ENGINEERS. Must be A.M.I.E.E. and have had experience in design of large electrical services installations. The successful applicant must be capable of taking charge of works from commencement to final completion.

Approved removal expenses will be paid to successful candidates in this Grade.

GRADE II (£815-£960 p.a. plus up to £40 p.a. London allowance).

ELECTRICAL ENGINEERING ASSISTANT. Must hold H.N.C. or have passed Sect. A of I.E.E. and be experienced in layout and design of electrical installation in buildings.

Candidates will be appointed at the appropriate point within the scale according to age and ability.

Full details, present salary and three copy testimonials to County Architect, County Hall, Kingston-upon-Thames, as soon as possible.

6313

Advertisements are accepted up to first post on Monday of the week of issue

If displayed with boxed rules, name or symbol block by Friday prior to week of issue

All communications to be addressed to: Classified Advertisement Department, ELECTRICAL REVIEW Dorset House, Stamford Street London, S.E.1

Original testimonials should not be sent with applications for employment

### JUNIOR ELECTRICAL ENGINEER

required by the UNITED KINGDOM ATOMIC ENERGY AUTHORITY, Production Group, Springfields Works, Salwick, Preston, Lancashire, to undertake a wide variety of training duties in the Electrical Services Department. The work will afford a good experience of electrical aspects of factory installation and maintenance and is intended to provide training for future managerial progression.

A recognised engineering apprenticeship and Graduate Membership of the Institution of Electrical Engineers, or a good degree, are essential.

Salary between £595 (at age 20) and £1,025 per annum. Contributory superannuation. Staff housing scheme.

Send POSTCARD for application form, quoting reference SF.76/J.7, to Works Secretary at above address.

Closing date 31st October, 1960.

6384

### GOVERNMENT OF SIERRA LEONE

Telecommunications Engineer, Posts and Telecommunications Department

RESPONSIBLE for supervising, maintaining, installing and developing telecommunications services generally, including carrier telephony, under the direction of the Postmaster-General and the Engineer-in-Chief.

Contract appointment. Salary range £1,470-£2,145 a year. Gratuity 15% of salary. Free passages. Rented quarters. Children's allowances. Generous leave.

Candidates, under 45 years, should be either A.M.I.E.E. or hold a Degree or Diploma in Electrical Engineering with Telecommunications subjects. They must have a sound knowledge of theory and practical experience of telecommunications engineering generally.

Write Director of Recruitment, Colonial Office, London, S.W.1, giving full names, age, qualifications and experience, quoting BCD.108/15/03/DII.

6408



## SENIOR ELECTRICAL DRAUGHTSMAN

required in the Engineering Department, London. Experience of power, lighting and control installation in the chemical or allied industries is essential. Applicants, preferably with H.N.C. and practical background in electrical engineering, should be able to work on own initiative.

Good salary and prospects in permanent post; non-contributory pension scheme.

Applications, giving details of age, qualifications and experience, should be sent to:—

The Staff Relations Officer (DL 170)  
**MONSANTO CHEMICALS LIMITED**  
Monsanto House, 10/18 Victoria Street  
London, S.W.1

6372

## Situations Vacant (continued)

BRITISH RAILWAYS

# ELECTRICAL FITTERS REQUIRED

for maintenance of electrical equipment on the Distribution Section of the Eastern Region Electric Traction system in the London Area. Applicants must have served a recognised apprenticeship. Experience with H.V. switchgear and/or control system an advantage. Shift working is involved.

Rate of pay is the equivalent of £11 os. 9d. per standard week of 44 hours, plus appropriate shift allowance which averages 33s. per week, and enhanced pay for overtime and Sunday duty. Certain free and reduced rate rail travel facilities. Pension and sick pay schemes. Prospects of promotion. Applicants will be required to undergo medical examination.

Apply in writing giving details of age, experience, etc., to the Electric Traction Engineer (London Area), British Railways, Eastern Region, off Ley Street, Ilford, Essex.

6244

## SOUTHERN ELECTRICITY BOARD

## Third Assistant Engineer (Planning)

Sub-Area Office of No. 2 (Newbury) Sub-Area. Salary N.J.B. Class M, Grade 10 (£1,275-£1,410 per annum). N.J.B. conditions of service.

The duties of the post will be to assist in the planning section principally on the detailed planning of, and scheduling of equipment for, major substations. Applicants should possess suitable technical qualifications.

Applications on forms obtainable from the Sub-Area Secretary, 7, Oxford Road, Newbury, Berks, and returned to him, quoting Z.1266, not later than 31st October, 1960.

Assistant Engineer  
(Substation Maintenance)

Portsmouth District of No. 3 (Portsmouth) Sub-Area. Salary N.J.B. Class J, Grade 7 (£1,275-£1,410 per annum). N.J.B. conditions of service.

The duties of the post will be to assist with the maintenance of plant and equipment at outdoor and indoor substations on both urban and rural systems. Candidates should have had a good technical training, experience of the testing and maintenance of plant and equipment, and should possess suitable technical qualifications. The appointment will involve standby duties.

Applications on forms obtainable from the Sub-Area Secretary, Lower Drayton Lane, Cosham, Portsmouth, and returned to him, quoting Z.1263, not later than 31st October, 1960.

Assistant Engineer  
(Substation Maintenance)

Marlborough District of No. 2 (Newbury) Sub-Area. Salary N.J.B. Class G, Grade 7 (£1,115-£1,245 per annum). N.J.B. conditions of service.

The duties of the post will be to assist with the maintenance of plant and equipment at outdoor and indoor substations on both urban and rural systems and to undertake standby duties. Candidates should have had a good technical training, experience of the testing and maintenance of plant and equipment, and should possess suitable technical qualifications.

Applications on forms obtainable from the Sub-Area Secretary, 7, Oxford Road, Newbury, Berks, and returned to him, quoting Z.1264, not later than 31st October, 1960.

Assistant Engineer  
(Maintenance and Operation)

Heston District of No. 1 (Southall) Sub-Area. Salary N.J.B. Class G, Grade 9 (£1,015-£1,140 per annum inclusive of London allowance). N.J.B. conditions of service.

The duties of the post will be to assist with the maintenance and operation of switchgear, transformers, auxiliary gear and underground cables up to and including 11 kV. The appointment will involve standby duties. Rented housing accommodation may be made available.

Applications on forms obtainable from the Sub-Area Secretary, 2/6, Windmill Lane, Southall, Middlesex, and returned to him,

quoting Z.1197, not later than 31st October, 1960.

## Assistant Engineer (Planning)

Basingstoke District of No. 3 (Portsmouth) Sub-Area. Salary N.J.B. Class F, Grade 11 (£765-£870 per annum). N.J.B. conditions of service.

The duties of the post will be to assist in the preparation of schemes and estimates for extensions of and reinforcement to overhead and underground H.V. and L.V. networks and to undertake standby duties if required. Suitable technical qualifications are necessary.

Applications on forms obtainable from the Sub-Area Secretary, Lower Drayton Lane, Cosham, Portsmouth, and returned to him, quoting Z.1228, not later than 31st October, 1960.

## General Assistant Engineer

Salisbury District of No. 4 (Bournemouth) Sub-Area. Salary N.J.B. Class F, Grade 11 (£765-£870 per annum). N.J.B. conditions of service.

The duties of the post will be to assist with distribution including minor construction work and general maintenance of H.V. and L.V. overhead and underground distribution systems, substation plant, etc. The possession of a suitable technical qualification will be an advantage. The successful candidate will be required to carry out standby duties if and when called upon to do so.

Applications on forms obtainable from the Sub-Area Secretary, 1, Priory Road, Bournemouth, and returned to him, quoting Z.1245, not later than 31st October, 1960.

The successful candidates for the above appointments will be required to contribute to the Electricity Supply (Staff) Superannuation Scheme, if eligible.

6425

## NORTH WESTERN ELECTRICITY BOARD

Third Assistant Engineer,  
Sub-Area Engineering Department,  
Clayton Testing Station

Applicants should have a wide experience in the testing of all types of protective equipment including associated control and other gear. Experience in high-voltage testing would be an advantage.

Preference will be given to applicants who are Associate Members of the Institution of Electrical Engineers.

Salary scale £1,190/£1,325 p.a., Grade L.10. N.J.B. conditions.

Second Assistant District Engineer,  
Blackburn District

The duties include assisting in the operation, maintenance and construction of underground and overhead mains, substations and transformers, and to undertake standby duties. Corporate Membership of the Institution of Electrical Engineers will be an advantage.

Salary scale £1,275/£1,410 p.a., Grade J.7. N.J.B. conditions.

Applications on forms to be obtained from the Manager, No. 5 Sub-Area, North Western Electricity Board, Jubilee Street, Blackburn, and returned to him by 31st October, 1960.

6383

CENTRAL ELECTRICITY  
GENERATING BOARD

## East Midlands Division

ASSISTANT SHIFT CHARGE  
ENGINEER, LEICESTER  
POWER STATION  
(Vacancy No. 232/60).

Applications are invited for the position of Assistant Shift Charge Engineer at Leicester Power Station, Rawdykes Road, Leicester.

Applicants should have received a sound technical training and have had experience in a modern power station. Preference will be given to candidates who possess the Higher National Certificate or its equivalent.

Salary will be in accordance with Class G, Grade 9 (£965-£1,090 per annum) of the National Joint Board Agreement, plus 10% allowance for shift duties.

Closing date for receipt of applications, 29th October, 1960.

ASSISTANT MAINTENANCE  
ENGINEER (Mechanical),  
LEICESTER POWER STATION  
(Vacancy No. 233/60).

Applications are invited for the position of Assistant Maintenance Engineer (Mechanical) at Leicester Power Station, Rawdykes Road, Leicester.

Applicants should have served a recognised apprenticeship in mechanical engineering. Preference will be given to candidates who possess technical qualifications to Higher National standard.

Salary will be in accordance with Class G, Grade 8 (£1,040-£1,165 per annum) of the National Joint Board Agreement.

Closing date for receipt of applications, 29th October, 1960.

STATION SHIFT CONTROL  
ENGINEER,  
WARRICK POWER STATION  
(Vacancy No. 237/60).

Applications are invited for the position of Station Shift Control Engineer at Warwick Power Station, Emscote Road, Warwick.

Candidates should be suitably qualified and have had experience in the control room.

Salary will be in accordance with Class E, Grade 10 (£765-£870 per annum) of the National Joint Board Agreement, plus £90 per annum allowance for shift duties.

Closing date for receipt of applications, 29th October, 1960.

ASSISTANT SHIFT CHARGE  
ENGINEER, CASTLE DONINGTON  
POWER STATION  
(Vacancy No. 240/60).

Applications are invited for the position of Assistant Shift Charge Engineer at Castle Donington Power Station, near Derby.

Candidates should have received a thorough practical and technical training and have had experience in the operation of modern high merit plant, together with the control of staff.

Technical qualifications leading to corporate membership of a professional institution will be an added advantage.

Salary will be within Class L, Grade 8 (£1,350-£1,500 per annum) of the National Joint Board Agreement, plus 10% allowance for shift duties.

Closing date for receipt of applications, 5th November, 1960.

These appointments will be pensionable within the terms and conditions of the Electricity Supply (Staff) Superannuation Scheme.

Applications should be submitted on the official form AE6/ACT, which may be obtained from the Station Superintendent and should be returned to him by the date stated.

O. S. WOODS.  
Divisional Controller.

13th October, 1960.

6441

## ELECTRICAL ENGINEER

required for the electrical department of an expanding mechanical engineering company engaged in the manufacture of equipment for the paper and corrugating industries. The candidate should have a Higher National Certificate (Electrical), have served an apprenticeship and be aged 25-30. The work is varied and interesting, dealing mainly with specialised drives and controls for capital plant. A pension scheme is in operation.

Written applications to Masson Scott & Co. Ltd., Riverside Road, Summerstown, London, S.W.17.

6273

# UNITED KINGDOM ATOMIC ENERGY AUTHORITY

Vacancies at

## A.E.R.E. HARWELL for

### ELECTRONIC MECHANICS

(Training would be given to men with a good skilled electrical background who have some knowledge of, and aptitude for, electronics and wish to further their experience in this work.)

### ELECTRICIANS AND ELECTRICAL FITTERS

(Several of these vacancies are for men with experience in installation on maintenance of heavy industrial or power-station electrical plant or control systems.)

### ELECTRO/MECHANICAL INSTRUMENT MECHANICS

(to operate and maintain a wide range of recording instruments in Reactors and other installations).

Several of these vacancies are with the new establishment being set up at Harwell for the National Institute for Research in Nuclear Science and for another new establishment being built nearby at Culham to take over the thermo-nuclear programme of work at present being carried out at Harwell.

Interesting and varied work where there are excellent opportunities for advancement. Assistance is given towards further education.

The Authority has sick leave and superannuation schemes and is at present operating a local assisted transport scheme.

*Housing*—Married men living outside the Harwell transport area will be housed or given assistance with house purchase.

*Please send for explanatory booklet and application forms to :—*

**Industrial Recruitment Office  
A.E.R.E., HARWELL, DIDCOT, BERKSHIRE**

**Situations Vacant (continued)**

**SOUTH  
WESTERN  
ELECTRICITY  
BOARD**

**Vacancies for :**

**District Commercial Engineer, Weston**  
**Second Assistant Engineer (Technical Plant and Meters), Chief Engineer's Department, Head Office, Bristol**  
**Third Assistant Engineer (Planning), Cornwall Group, Pool, Cornwall**

Closing Date for Receipt of Completed Applications is Friday, 4th November, 1960

**DISTRICT COMMERCIAL ENGINEER, WESTON.**

Salary according to Class G, Grade 3, Salary Scale 13 (£1,440 to £1,610 per annum) of the N.J.B. Agreement.

The successful candidate will be responsible to the District Manager for the organisation and control of all commercial activities within the District in accordance with the Board's commercial policy.

Applicants should have wide experience on the commercial side of an electricity supply undertaking, and possession of appropriate qualifications at least equivalent to the Higher National Certificate in Electrical Engineering is necessary.

Applications to be made on standard form AE6/ACT, OBTAINABLE BY POSTCARD ONLY from the District Manager, South Western Electricity Board, 168, Locking Road, Weston-super-Mare, Somerset.

**SECOND ASSISTANT ENGINEER (Technical Plant and Meters), CHIEF ENGINEER'S DEPT., HEAD OFFICE, BRISTOL.**

Salary according to Class AX, Grade 5 Salary Scale 13 (£1,375 to £1,610 per annum) of the N.J.B. Agreement.

Duties will include the preparation of specifications for and the examination of the performance of all types of distribution equipment, development of new techniques, and the solution of problems associated with protection, metering and light current practices.

Candidates should have had a sound technical and practical training, have comprehensive ex-

perience in the operation and maintenance of distribution systems up to and including 33 kV, and should possess as a minimum qualification the Higher National Certificate in Electrical Engineering or equivalent qualifications.

Applications to be made on standard form AE6/ACT, OBTAINABLE BY POSTCARD ONLY from the Establishments Officer, South Western Electricity Board, Electricity House, Colston Avenue, Bristol, 1.

**THIRD ASSISTANT ENGINEER (Planning), CORNWALL GROUP, POOL, CORNWALL.**

Salary according to Class J, Grade 9, Salary Scale 9 (£1,115 to £1,245 per annum) of the N.J.B. Agreement.

The person appointed will be required to assist in the planning and preparation of schemes and reports for immediate and long-term proposals for the extension and reinforcement of overhead and underground distribution systems up to and including 33 kV. The duties will include load flow and fault level calculations, estimates of load growth and work on capital budgets and costing.

Experience of planning, construction and operation of overhead and underground systems up to 33 kV is required. Qualifications leading to membership of the Institution of Electrical Engineers are desirable.

Applications to be made on standard form AE6/ACT, OBTAINABLE BY POSTCARD ONLY from the Group Administrative Officer, South Western Electricity Board, Pool, Redruth, Cornwall.

**THE BERCO GROUP OF COMPANIES**

TWO important positions are to be created within the Group to raise output in step with an ever-increasing demand for high-quality products. We invite applicants to give full details of past history for:

**WORKS MANAGER**

for works employing 450 personnel in the manufacture of a wide variety of light electrical apparatus.

The successful applicant will be responsible for all aspects of production, including planning, methods and production control in assembly and processing shops, machine shop, tool room and sheet metal shop. Candidates should be practical, mechanical or production engineers, with shop floor experience, and have attained a position of authority as either works manager or production manager with manufacturers of light mechanical or electrical equipment, and have knowledge of modern manufacturing techniques. Professional qualifications in production or mechanical engineering would be an advantage, but personality, organising ability and leadership are most important to candidates wishing for further advancement with a growing organisation.

**CHIEF DESIGN AND DEVELOPMENT ENGINEER**

required to take charge of Designs Office, and to supervise the development of components for professional electronics, light control gear and industrial resistances. Applicants should have a degree in mechanical engineering and some experience of the manufacture of electrical components. Prospects for advancement are considerable for suitable applicant.

Salaries will be based on qualifications and experience, and the company will be pleased to assist with housing problems if needed. Superannuation and bonus schemes are in operation.

Replies will be dealt with in the strictest confidence, and should be addressed to:

**The Managing Director, Dept. A.E.R.  
THE BRITISH ELECTRIC RESISTANCE CO. LTD.**

Queensway, Enfield, Middx.

6373

**CENTRAL ELECTRICITY GENERATING BOARD**

East Midlands Division

**RESIDENT ENGINEER (Civil Works), TRANSMISSION DEPARTMENT, DIVISIONAL HEADQUARTERS (Vacancy No. 238/60).**

A vacancy exists for a Resident Engineer to supervise the Headquarters works of the Central Electricity Generating Board in the East Midlands Division. The successful applicant will be located at Nottingham and will be responsible to the Chief Transmission Project Engineer at Headquarters for the supervision of contractors in the construction of civil works associated with 275-kV and 132-kV substations.

Applicants should have a wide experience of civil and building works, including reinforced concrete structures.

Applicants should be Corporate Members of the Institution of Civil Engineers.

The salary will be in accordance with Grade BX.5, Scale 14 (£1,535-£1,720 per annum) of the National Joint Board Agreement, and the position will be pensionable within the terms and conditions of the Electricity Supply (Staff) Superannuation Scheme.

Applications should be addressed to O. S. Woods, Esq., Divisional Controller, East Midlands Division, P.O. Box 25, Barker Gate, Nottingham, to arrive not later than 25th November, 1960.

O. S. WOODS,  
Divisional Controller.  
6th October, 1960.

6440

**BRITISH ENGINE BOILER & ELECTRICAL INSURANCE CO. LTD.  
Longridge House, Manchester, 4**

**ELECTRICAL SURVEYORS** required in Scotland, also Manchester. Permanent positions carrying progressive salary scale £800 to £1,100 and non-contributory pension. Candidates, aged 26 to 32, with H.N.C. in Electrical Engineering or Grad. I.E.E., and with apprenticeship in manufacture or repair of electrical machinery, are invited to apply stating age, qualifications and experience.

6399



# M.K. ELECTRIC LIMITED

have the following vacancies in their Technical Drawing Office:—

**DESIGNERS**—experienced in the design of small Electrical/Mechanical products for large quantity manufacture.

**DRAUGHTSMEN**—with routine Drawing Office experience and preferably in connection with small electrical products—preparing standard drawings, data sheets, etc.

Excellent working conditions in a new drawing office. Five-day week of 37½ hours. Holiday arrangements honoured and attractive salaries offered according to experience.

Applications treated in strict confidence if addressed to:—

**Technical Manager, M.K. ELECTRIC LTD.  
Shrubbery Road, Edmonton, London, N.9**

6368

## THE BAHRAIN PETROLEUM COMPANY LIMITED

require the services of an

# ELECTRICAL SPECIALIST

The duties are primarily concerned with the supervision and inspection of electrical work being carried out for this company by outside contractors such as overhead and underground power lines, substations, domestic and industrial wiring and the installation of electrical equipment.

Applicants should be between 25-35 years of age, possess an H.N.C. in Electrical Engineering and have had five years experience as an electrician and a further year as a job leader or electrical inspector.

The commencing salary will be dependent upon qualifications and experience, in addition to which the following are provided:—

**FREE AIR-COOLED ACCOMMODATION**  
**LIVING ALLOWANCE - INITIAL KIT ALLOWANCE**  
**FREE MEDICAL ATTENTION**  
**PAID HOME AND LOCAL LEAVES**  
(passages paid for the former and generous assistance towards the latter)  
**PENSION AND PROVIDENT FUND SCHEMES**

Apply in writing with full particulars, quoting "ETS/ECON" to

## CALTEX SERVICES LIMITED

Caltex House, Knightsbridge Green, London, S.W.1.

6371

## CENTRAL ELECTRICITY GENERATING BOARD

### Eastern Division

APPLICATIONS are invited for the following appointment:—

**ASSISTANT ENGINEER**  
(Efficiency and Testing),  
GOLDINGTON GENERATING  
STATION (Bedford).

Salary N.J.B. Class H, Grade 7, Scale 10,  
£1,190-£1,325 per annum.

Applicants should possess the Higher National Certificate in Mechanical and/or Electrical Engineering or other equivalent qualifications, and have had previous experience in a large modern generating station.

The successful applicant will be required to assist in the efficient and economical operation of the generating plant, the preparation of statistics and the keeping of technical records.

Applications, quoting reference Staff Vacancy No. 1387, stating age, experience and present position, should be sent to the Controller, Central Electricity Generating Board, Eastern Division, West Farm Place, Chalk Lane, Cockfosters, Barnet, Herts., to arrive not later than 29th October, 1960. 6414

### PATENT EXAMINERS AND PATENT OFFICERS

PENSIONABLE posts for men or women for work on the examination of Patent applications. Age at least 21 and under 29 (36 for Examiners), with extension for Regular Forces service and Overseas Civil Service. Qualifications: normally first or second class honours degree in physics, chemistry, engineering or mathematics, or equivalent attainment, or professional qualification, e.g., A.M.I.C.E., A.M.I.Mech.E., A.M.I.E.E., A.R.I.C.

London salary (men) £655-£1,460; provision for starting pay above minimum. Promotion prospects.

Write Civil Service Commission, 17, North Audley Street, London, W.1, for application form, quoting S/128/60, and stating date of birth. 6404

## CENTRAL ELECTRICITY GENERATING BOARD

### South Wales Division

APPLICATIONS are invited for the following superannuable N.J.B. appointments:—

**ASSISTANT ENGINEER (Instruments),  
USKMOUGH "A" POWER STATION,  
WEST NASH, Nr. NEWPORT, MON.  
(Vacancy No. 270/ER/60).**

Salary Schedule A, Class K, Grade 8, Scale 11 (£1,275-£1,410 per annum).

Applicants should possess H.N.C. or equivalent qualifications, and have experience in the maintenance of power station instruments, including the latest automatic boiler control techniques.

Closing date 29th October, 1960.

**ASSISTANT MAINTENANCE  
ENGINEER (Electrical),  
CARMARTHEN BAY  
POWER STATION  
(Vacancy No. 271/ER/60).**

Salary Schedule A, Class K, Grade 8, Scale 11 (£1,275-£1,410 per annum).

Applicants should have experience in the maintenance of modern power station equipment and will be required to carry out practical and planning office duties.

H.N.C. or equivalent qualifications.

**STATION SHIFT CONTROL ENGINEER,  
LLYNFI POWER STATION,  
Nr. BRIDGEND, GLAM.  
(RE-ADVERTISEMENT)  
(Vacancy No. 272/ER/60).**

Salary Schedule A, Class G, Grade 10, Scale 6 (£890-£1,015 per annum) plus 10% shift enhancement.

Applicants should possess H.N.C. or equivalent qualifications and have had experience in a modern power station.

Previous applicants need not re-apply.

**ASSISTANT ENGINEER (Co-ordinating),  
USKMOUGH "A" POWER STATION,  
WEST NASH, Nr. NEWPORT, MON.  
(Vacancy No. 273/ER/60).**

Salary Schedule A, Class K, Grade 10, Scale 9 (£1,115-£1,245 per annum).

Applicants should possess an appropriate engineering qualification and be able to organise and undertake job training and instruction of power station personnel. The successful applicant will be required to organise civil defence, fire fighting, etc., and be responsible for promotion of safety schemes, collection of data, compilation of records, etc., and the supervision of apprentices and general assistance. He will also conduct any special investigations required by the Station Superintendent and Deputy Station Superintendent, and will carry out duties under the general direction of the Deputy Station Superintendent.

Special application forms obtainable from Secretary, South Wales Division, Central Electricity Generating Board, Twyn-y-fedwen Road, Gabalfa, Cardiff, to be returned by 4th November, 1960. 6430

## YORKSHIRE IMPERIAL METALS LTD.

The company wishes to appoint a  
**GRADUATE ELECTRICAL ENGINEER**

between the age range 25-30. Candidates should have a sound electrical engineering training with subsequent experience of some of the following switchgear, motor control gear, rectifiers and A.C. and D.C. motors.

Duties will be concerned with the design, construction, maintenance and instrumentation of a wide range of electrical equipment for the company's largest and still expanding factory site, at Leeds, with a maximum demand of 12 MVA.

The company offers attractive conditions of employment together with a pension and life assurance scheme and a profit-sharing scheme.

Detailed applications, quoting present salary, should be marked "Electrical Engineer—Confidential," and addressed to the

Chief Personnel Officer  
**YORKSHIRE IMPERIAL METALS LTD.**  
P.O. Box 166, Leeds

6385

## LONDON ELECTRICITY BOARD

### Assistant Distribution Engineer

APPLICATIONS are invited for the above position in the Board's West End District at 25, Eccleston Place, S.W.1.

Applicants should have had a sound technical education to the standard of the Higher National Certificate, and possess practical experience in all branches of engineering work associated with the organisation of a district distribution department.

The post is graded under Schedule A of the National Joint Board Agreement as Class K, Grade 11, £1,090 per annum, rising to £1,215 per annum, inclusive of London allowance.

Applications should be sent direct to the District Manager at the above address, to arrive within 14 days of the publication date of this notice. Please quote ref. PER/V/3081/R. 6421

**GWB**

### CONTROL GEAR DIVISION

### SENIOR AND JUNIOR

## CONTRACT SALES ENGINEERS

required for sales office duties. Must be familiar with the routine of preparing and estimating for motor control schemes for all types of industry. Future sales representatives will be selected from the internal sales staff. Good pay and prospects for the right man.

Apply, in confidence, giving details of training and experience to:—

**W. Hooley, Manager  
Control Gear Division  
G.W.B. FURNACES LTD.  
Lower Gornal, Dudley, Worcs.**

6402

## Situations Vacant (continued)

**BICC**

**I**N order to meet the demands of the rapidly expanding Accessories Division at our Prescot Works, we wish to fill the following posts:—

**DESIGNER/DRAUGHTSMEN**

(Electrical and Mechanical)

**SENIOR DRAUGHTSMEN**

(Electrical and Mechanical)

**JUNIOR DRAUGHTSMEN**

(Electrical and Mechanical)

The Accessories Division supplies a wide range of equipment mainly associated with electrical distribution and transmission, and successful candidates will be employed in one of the following fields:—

1. Railway Electrification Overhead Equipment.
2. Overhead Line Equipment (all voltages).
3. Accessories for Underground Cables (all voltages).
4. Air-Break Switchgear and Fuse-Gear.
5. Busbar and Current-Collection Installations and Fittings.
6. Substation Panels and Street Distribution Pillars.
7. Electrical Connectors of all types.

Previous experience in precisely these fields is not essential, but we wish to appoint men having initiative, a sense of responsibility, and ability to advance in our organisation.

Candidates should have served a recognised engineering apprenticeship or completed an alternative form of practical workshop training and must be qualified to at least O.N.C. standard.

Commencing salaries will be offered in accordance with qualifications and experience within the following scales:—

**DESIGNER/DRAUGHTSMEN:**  
£850 - £1,150 p.a.

**JUNIOR & SENIOR DRAUGHTSMEN:**  
£585 - £950 p.a.

Individual salaries are subject to review annually according to merit, and in addition an annual prosperity bonus is payable to all staff having more than 12 months' service. A contributory pension scheme is in operation.

Applications to:—

Works Personnel Officer  
Ref. No. P.515  
B. I. C. C. LIMITED  
Prescot, Lancs.

6382

**TRANSFORMERS (WATFORD) LIMITED**

require a

**SENIOR ENGINEER-DRAUGHTSMAN**

experienced in large H.V. power transformers up to 132 kVA. Progressive appointment. Salary commensurate with experience and qualifications.

Apply: Managing Director, Transformers (Watford) Ltd., Sandown Road, Watford.

6293

**EASTERN ELECTRICITY BOARD**

**A**PPICATIONS are invited for the following appointments. The successful candidates will be required to contribute to a superannuation scheme and may be required to undergo a medical examination.

**Essex Sub-Area**

**FOURTH ASSISTANT ENGINEERS**  
(a) Chelmsford District (two posts) (274/60.R.);  
(b) Southend District (273/60.R.).

Candidates should have had a sound technical training and suitable experience in the construction, operation and maintenance of H.V. and L.V. overhead and underground distribution systems including substations.

Salary N.J.B. (a) Class F, Grade 11 (£765-£870); (b) Class H, Grade 11 (£890-£1,015).

Apply by letter by 4th November, 1960, as follows:—(a) D. H. Walker, A.M.I.E.E., Manager, Eastern Electricity Board, Anchor Street, Chelmsford, Essex. (b) J. Linton, A.H.W.C., M.I.E.E., A.I.Mech.E., Manager, Southend-on-Sea District, Eastern Electricity Board, 85, London Road, Southend-on-Sea, Essex.

**Northmet Sub-Area**

**EDMONTON DISTRICT DISTRICT COMMERCIAL ASSISTANT** (Ref. 997) (272/60.R.).

Candidates should be fully experienced in modern installation practice, able to prepare specifications and competitive quotations and be competent to design thermal storage heating schemes, particularly floor warming. A sound knowledge of the tariffs and their application, including supply by special agreement is necessary.

Salary N.J.C. Grade 3 (£780-£880) plus London allowance.

Apply by letter to C. A. Baker, B.Sc.(Eng.) Lond., M.I.E.E., Manager, Eastern Electricity Board, 305, Fore Street, Edmonton, London, N.9, by 31st October, 1960. 6428

**ADMIRALTY****Royal Naval Scientific Service**

**SENIOR SCIENTIFIC OFFICERS** and **SCIENTIFIC OFFICERS** required in establishments in the following locations: LONDON AREA, HASLEMERE, BALDOCK, POOLE, CHELTENHAM, PORTLAND, PORTSMOUTH.

Applications invited from graduates and post-graduate research workers with the following interests: PHYSICS (classical, mathematical and electronic), ELECTRICAL ENGINEERING (electronic, telecommunications and radio), MATHEMATICS (pure and applied), HYDRODYNAMICS, MECHANICAL ENGINEERING (including servomechanisms, gyroscopes and welding development), CHEMISTRY (ceramics with solid state properties).

Candidates must normally be natural-born British subjects of natural-born British parents, with First or Second Class Honours Degrees or equivalent qualifications. S.S.O.s must have had three years' postgraduate experience and be not less than 26 years of age.

Salaries (men): S.S.O. £1,330-£1,640; S.O. £730-£1,205 (London); somewhat lower in Provinces. Appointments unestablished (with F.S.S.U. benefits), but opportunities may occur for those between ages of 21 and 32 to compete for established posts.

Forms from Ministry of Labour, Technical and Scientific Register (K), 26, King Street, London, S.W.1, quoting Order No. A.359/OA.

255

**DORSET EDUCATION COMMITTEE**

**Poole College for Further Education**  
Principal : A. H. Andrews, A.R.C.A.

**Engineering Department**

**A**PPICATIONS are invited for the post of GRADE B ASSISTANT to teach electrical engineering subjects. At present the appointment is for work at the electrical installation level and candidates are required to have Higher National Certificate in Electrical Engineering or equivalent qualification, together with wide practical experience.

Application forms may be obtained from the Principal, Poole College for Further Education, North Road, Parkstone, Poole, Dorset, to be returned not later than a fortnight after the appearance of the advertisement. 6442

**"So you want to move . . . "**

**O**R do you? Before you rush in to answer this advertisement you should consider the matter very carefully. Perhaps the chip on your shoulder is not all that big and you are already not so badly off after all.

But if you do decide to move, George Ellison Limited is one of the firms that seems to satisfy most people. Happy atmosphere, interesting work, good promotion prospects, bonus, excellent canteen, good sports and social facilities, and a really worthwhile non-contributory pension scheme—these are some of the many important advantages to be gained from working for this famous switchgear firm.

Vacancies don't come very often, but at the moment they are looking for the right men to fill the following:—

**DRAUGHTSMEN**

Seniors for low-tension oil or air circuit breaker switchboard contracts.

Juniors for general switchgear work, with some experience.

**DESIGNERS**

Senior for 11-kV high-tension oil circuit breakers.

Senior for low-tension oil or air-break switchgear.

**CONTRACTS ENGINEER**

For Inside Sales Department. Under 40, H.N.C. standard, preferably with experience of switchgear and control gear.

Interested? Then send full particulars including age, education and salary requirements to:—

**The Personnel Manager**  
**GEORGE ELLISON LIMITED**  
Perry Barr, Birmingham, 22b

6419

**CENTRAL ELECTRICITY GENERATING BOARD****Midlands Division**

**THIRD ASSISTANT ENGINEER (Control)** required for shift duties at the Birmingham Grid Control Centre. N.J.B. service conditions, superannuable appointment, salary within Schedule B, Class CX, Grade 8, Scale 12, £1,105-£1,500 per annum, plus 10% shift allowance.

Applicants should have received a sound education and basic training, with subsequent experience in the electricity supply industry, preferably in power stations. H.N.C. or equivalent qualifications essential. Successful applicants will be required to assist the Control Engineer in all functions necessary for the proper control of a large portion of the grid system.

Apply, quoting Vacancy No. 277/60MD, on form AE6, available from the System Operation Engineer, Warwick House, Redhill Road, West Heath, Birmingham, 31. Closing date for receipt of applications, 31st October, 1960. 6409

**A LARGE TRANSFORMER COMPANY**

has a vacancy for a **WORKS SUPERINTENDENT** age 30/40 years, experienced in modern production methods. Present range 5 kVA to 15 MVA. Design experience an advantage. Minimum qualifications H.N.C. (Electrical). Successful applicant will be responsible to the General Works Manager.

Applications, which will be treated in confidence, giving full particulars of age, experience and qualifications to the Personnel Manager.—Box 6397.

**UGANDA ELECTRICITY BOARD**

THE Board requires ASSISTANT ELECTRICAL ENGINEERS to participate in the interesting work of electrical development in the Protectorate.

Uganda has a very pleasant climate and income tax is lower than in the United Kingdom. Passages for employee and family, partly furnished accommodation, medical and dental treatment all free. Five days' overseas leave for every completed month of service in East Africa, plus local leave. Normal tours of duty 4-36 months.

Applicants should be Corporate Members of an Institution of Electrical Engineers or should have technical qualifications leading to that status.

Some experience in the construction and/or operation and maintenance of an electricity supply network, including overhead lines and substations with voltages up to 33 kV is essential. Experience at higher voltages is desirable.

Commencing salary depending upon qualifications and experience within the scale £1,265 - £35 to £1,580 per annum. In addition, a monthly gratuity of 30% of salary will be paid.

Persons serving in the United Kingdom electricity industry may be seconded to Uganda or periods of up to two years without loss of pension or other rights with the approval of their employing authority. Annual leave entitlement for seconded personnel is six weeks.

Application forms and further information on Uganda and the Uganda Electricity Board may be obtained from the London Representative, Uganda Electricity Board, Uganda House, Trafalgar Square, London, W.C.2, to whom completed forms should be returned not later than 14th November, 1960.

E. H. WILSON,  
Secretary.  
6420

**SOUTH EASTERN ELECTRICITY BOARD****DISTRICT COMMERCIAL ENGINEER, Swale District at Sittingbourne.**

Salary under N.J.B. Class F, Grade 3, Scale 12, £1,350-£1,500 p.a. with progression to Grade 2 (maximum salary £1,610) subject to satisfactory service. Superannuable. Duties will include the organisation and control of the commercial department which has a contracting section and three showrooms. The district has an area of 120 square miles and supplies approximately 27,000 consumers. Applicants should be conversant with tariff negotiations, sales activities, contracting and general load development, and should preferably be Corporate Members of the I.E.E.

Applications quoting ER and naming 2 referees, to District Manager, SEEBOARD, 88a, High Street, Sittingbourne, Kent, by 2nd November, 1960.

**ASSISTANT DISTRICT ENGINEER, Dorking and Epsom District.**

Applicants who should be suitably qualified, should have received all-round training and experience in the engineering department of a district, covering planning, construction, operation and maintenance. The position will entail standby duties. This is an opportunity to gain valuable experience in an urban and rural distribution system. Salary £1,040-£1,165 per annum under N.J.B. Class F, Grade 7. Superannuable. Consideration will be given to private car allowance and assistance with regard to house purchase.

Applications quoting ER and naming 2 referees, on forms from District Manager, SEEBOARD, 56, South Street, Dorking, by 2nd November, 1960.

GEORGE WRAY,  
Secretary.  
6427

**OLDHAM EDUCATION COMMITTEE****Municipal Technical College**

APPLICATIONS are invited for the post of GRADE B ASSISTANT in the Electrical Engineering Department to teach Electrical Installation and Electrical Technicians subjects to City and Guilds Final.

Burnham salary, i.e., within the range of £700 to £1,150 per annum, with additions for degree or equivalent. Starting salary according to previous industrial and/or teaching experience.

Further particulars and application forms from Director of Education, Union Street West, Oldham.

**SOUTH WALES ELECTRICITY BOARD****Commercial Assistant**

APPLICATIONS are invited for the position of COMMERCIAL ASSISTANT in the Barry District of the Cardiff and East Central Area.

Salary N.J.B. Class F, Grade 7, Scale 8 (£1,040/£1,165 per annum).

The duties of this post will be of a general nature and preference will be given to engineers possessing a Higher National Certificate in Electrical Engineering.

Applications stating age, present position, present salary, qualifications and experience, should be addressed to C. L. Townsend, Assoc. I.E.E., Manager, Cardiff and East Central Area, 445/447, Cowbridge Road East, Cardiff, to arrive not later than 5th November, 1960.

Please quote reference 194/60/ER, endorsing envelope "Commercial Assistant."

R. G. WILLIAMS,  
Secretary.  
6417

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD**

APPLICATIONS invited for the following posts:-

- (a) ENGINEERING DRAUGHTSMAN (Electrical).
- (b) ENGINEERING DRAUGHTSMAN (Heating and Ventilating).

Salary within the range of £570-£1,300 according to experience and qualifications. Preference will be given to candidates who hold the Higher National Certificate or Sections A and B of the Institution of Heating and Ventilating Engineers (or equivalent), and have had suitable practical and theoretical training including site or workshop experience. Consideration will be given to experience as alternative to qualifications.

Applications stating age, qualifications, experience and present salary, with names of three referees, should reach the Secretary, 40, Eastbourne Terrace, London, W.2, by 7th November, 1960.

6407

**MIDLANDS ELECTRICITY BOARD**

SENIOR SALES REPRESENTATIVE (Agricultural) required in the Shropshire and Herefordshire Sub-Area. Candidates should have had extensive experience of rural development and sales, and be fully conversant with all domestic uses. Must have a sound knowledge of and be able to advise upon the use of electricity in farming and horticulture; be able to discuss intelligently relevant farming matters and practice, and be prepared to give talks to local agricultural and horticultural associations.

The possession of a driving licence is essential and the ability to estimate for installation work and the possession of technical qualifications would be an advantage.

Salary £780/£880 per annum (N.J.C. Grade 3). Superannuable.

Apply by letter stating age, experience and present position to Mr. W. Winwood, Sub-Area Manager, Midlands Electricity Board, Spring Gardens, Ditherington, Shrewsbury.

F. W. CATER,  
Secretary.  
6406

**TO ALL ELECTRICAL ENGINEERS SEEKING A SALES CAREER**

We offer a unique opportunity. Vacancies exist in our sales organisation for TECHNICAL REPRESENTATIVES to work in the LONDON, MANCHESTER, BIRMINGHAM, NEWCASTLE and EDINBURGH areas. If you feel that you can satisfy the following requirements why not write to us?

A sound engineering training.

Technical qualifications to about H.N.C. level.

Experience in a sales or design department.

A car owner or holder of a current driving licence.

A knowledge of rectifiers, transformers, D.C. power supply or battery charging equipments would be considered an advantage.

Write, without delay, to ELECTRO-AUTOMAT LTD., SWINTON, Nr. MANCHESTER, giving details of your career. Please quote reference TR/ER/MJP.. 6387

**Situations Vacant (continued)****CITY OF SALFORD**

**A**PPLICATIONS are invited from appropriately qualified persons for the following posts in the Department of the City Engineer and Surveyor (G. ALEXANDER McWILLIAM, B.Sc., A.M.I.C.E., A.R.I.C.S., M.I.Mun.E.).

MECHANICAL and ELECTRICAL ENGINEER (Section Head), Grade A.P.T. V (£1,310-£1,480 per annum).

ASSISTANT ELECTRICAL ENGINEER, GRADE A.P.T. III/IV (£935-£1,310 per annum).

The successful applicants will be engaged on the design, specification and installation of mechanical and electrical heating and ventilating services to buildings of many types including multi-storey blocks of flats. They will also work with the civil engineering staff on the design and installation of capital schemes involving mechanical and electrical plant carried out for all committees of the Corporation. The commencing salary will be dependent upon qualifications and experience.

Housing accommodation may be provided in approved cases.

The posts are subject to the provisions of the Local Government Superannuation Acts, the National Scheme of Conditions of Service, Standing Orders of the City Council, the passing of a medical examination, and are terminable by one calendar month's notice. A 5-day week is in operation.

Applications indicating the post applied for, and stating age, education, qualifications and details of experience together with the names of two referees should be sent to the City Engineer and Surveyor, Town Hall, Salford, 3, Lancs, to arrive not later than Monday, 14th November, 1960.

R. RIBBLESDALE THORNTON,  
Town Clerk.  
6422

**MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD**

**S**YSTEM CONTROL ENGINEER required in the Board's No. 4 Sub-Area, based on the Control Centre at Legacy, near Wrexham.

Salary within range £1,190/£1,325 per annum (N.J.B. Scale 10), plus 10% shift enhancement.

Duties, which will be on a shift basis, will be those normally associated with the control of switching operations on extensive networks covering eight districts, and the co-ordination of the loadings on the 33-kV network which interconnects numerous 132/33-kV injection points.

Applicants should have had operational experience in distribution work and in substations. Appropriate technical qualifications an advantage.

Appointment subject to medical examination. Pension scheme.

Application forms obtainable from the Manager, No. 4 Sub-Area, Electricity House, Rhosyddien, nr. Wrexham. Closing date 4th November, 1960.

6423

The world's leading inventors and manufacturers of special-purpose precision machinery for the Tobacco Industry have opening in their London Drawing Office for:-

## SENIOR ELECTRICAL DESIGNER

Desirable applicant should be aged 30-40, with technical qualifications at least up to H.N.C. level, and with practical experience in the design and application of control circuits for small motors and electro-mechanical detector units. Some knowledge of electronics an advantage.

This opportunity is permanent and progressive; it offers immediate pensionable staff position with three weeks' annual holiday and attractive commencing terms.

Applications stating age, qualifications and experience should be personally addressed in confidence to:-

G. B. Salmon  
**MOLINS MACHINE CO. LTD.**  
Evelyn Street, London, S.E.8

6306

**SOUTH WALES ELECTRICITY BOARD****ARCHITECTURAL ASSISTANTS**

Applications are invited for two Senior Architectural Assistants in the Chief Engineer's Department at Head Office, St. Mellons.

Salary : Class AX Grade 12, Scale 6 (£780/£1,015 per annum).

The successful applicants will receive a commencing salary of at least £890 per annum.

Applicants should preferably be of Intermediate R.I.B.A. standard.

Applications stating age, present position, present salary, qualifications and experience should be addressed to the undersigned at St. Mellons, Cardiff, so as to arrive not later than 5th November, 1960. Please quote reference 137/60/ER, endorsing envelope "Architectural Assistants".

R. G. WILLIAMS,  
Secretary 6416

**IMPERIAL SMELTING CORPORATION LIMITED****Assistant Electrical Engineer—Swansea Vale**

**A**PPLICATIONS are invited from suitably qualified engineers aged 25-35 for the position of Assistant Electrical Engineer at the above Corporation's Swansea Works. The duties will involve assistance in the supervision and carrying out of electrical maintenance and repair work, installation of new equipment and advising on suitability of electrical equipment.

Candidates who are Graduate Members of the Institution of Electrical Engineers with three years' electrical supervisory experience will be considered, but a B.Sc. with five years' experience or Associate Membership of the Institution of Electrical Engineers is desirable. (ER/A.E.E.)

**Assistant Instrument Engineer**

A qualified engineer, preferably with professional qualifications, or University Degree in Physics, Electrical Engineering or Electronics, but a candidate with H.N.C. or similar qualification will be considered. Knowledge and experience of instrument maintenance and development is essential, preferably in the heavy chemical or metallurgical industry. (ER/A.I.E.)

Applications should be marked "Confidential" and submitted, with appropriate references, to:-

**Personnel Manager****IMPERIAL SMELTING CORPORATION LTD.**

St. Andrew's Road  
Avonmouth.

6424

**CENTRAL ELECTRICITY GENERATING BOARD****South Western Division**

**A**SSISTANT ENGINEERS (Operation) required at Hinkley Point Nuclear Power Station. (Vacancy No. ER/143/60.)

Superannuation scheme. Salary N.J.B. provisionally within Scale II, £1,275-£1,410 per annum.

Following a short period of theoretical training, successful candidates will, initially, be employed upon certain aspects of plant inspection and will ultimately be responsible for the operation on shift of a reactor and its associated generating plant. These positions will give excellent experience for engineers wishing to make their career in nuclear power stations. Previous applicants need not apply.

Applications on Form A.E.6/ACT, obtainable from the Divisional Secretary, 26, Oakfield Road, Bristol, 8, should be completed, quoting vacancy number, and returned by 31st October, 1960.

**ASSISTANT CONSUMERS' ENGINEER**

required by ADEN GOVERNMENT ELECTRICITY DEPARTMENT on contract for one tour of 18/24 months in first instance.

Commencing salary according to age and experience in scale (including pay differential) rising to £1,579 a year. Supplementary allowance £144-£120 a year. Gratuity at rate of 12½% of total salary drawn. Free passages. Outfit allowance £60.

Secondment from a Home Area Board may be possible in certain circumstances.

Candidates should possess H.N.C. in Electrical Engineering or equivalent, and have had technical training and experience in utilisation of electrical energy in industrial, commercial and domestic premises.

Apply to CROWN AGENTS, 4, Millbank, London, S.W.1, for application form and further particulars, stating age, name, brief details of qualifications and experience, and quoting reference M2A/51004/EF.

6396

**MONMOUTHSHIRE COUNTY COUNCIL****County Architect's Department****Appointment of Electrical Engineer**

**A**PPLICATIONS are invited for the appointment of an ELECTRICAL ENGINEER on Grade A.P.T. II, salary £815-£960 per annum.

The post will be subject to the provision of the Local Government Superannuation Act.

Forms of application, particulars of post and conditions of service can be obtained from S. Leyshon, A.R.I.B.A., County Architect, Queen's Hill, Newport, Mon., to whom the application, together with the names of two referees, must be returned not later than Friday, 4th November, 1960.

VERNON LAWRENCE,  
County Hall,  
Newport, Mon.

Clerk of the Council.  
6395

# Electrical Engineer

for

## FORWARD PLANNING

required by large Electrical Engineering Company situated in the Midlands.

This senior position calls for a man with honours degree in Electrical Engineering or A.M.I.E.E., and experience in the design or development of rotating machines. Duties include investigations to obtain specifications of rotating machines for automotive applications, advanced designs to meet the specifications and the use of digital computers. The starting salary would be commensurate with qualifications and experience and is unlikely to be less than £1,200 p.a.

Apply immediately, giving full details of age, qualifications and experience, to Box No. 6405.

### BRADFORD INSTITUTE OF TECHNOLOGY

#### Department of Electrical Engineering

**A**PPICATIONS are invited for the following posts in this rapidly expanding department which offers exceptional opportunities for teaching, consulting and research work:

**E**NIOR LECTURER IN ELECTRICAL ENGINEERING. Salary scale £1,550 to £1,750.

**L**ECTURER IN ELECTRICAL ENGINEERING. Salary scale £1,370 to £1,550.

Candidates should be suitably qualified to teach to final degree standard in electrical power and machines or electronics and telecommunications. Industrial and research experience will be a recommendation.

The successful candidates will be encouraged to develop industrial contacts and undertake research for which adequate facilities will be available.

Previous industrial and research experience at suitable level will be taken into account in fixing the commencing salary.

Further particulars and forms of application may be obtained from the Registrar, Bradford Institute of Technology, Bradford, 7.

HENRY PATTEN,  
Clerk to the Governors.

6381

### ELECTRICAL ENGINEER FOR MALAYA

**A**N old-established British company with branches throughout Malaya requires Electrical Sales Engineer, preferably with communications experience. Must be under 36 years old and a Graduate or Associate Member of the Institution of Electrical Engineers who has had a minimum of 3 years' sales experience, preferably overseas.

Commencing salary £1,400-£2,250 p.a. depending on experience, plus commission, free furnished accommodation, child allowance, provident fund and usual other benefits.

Please send full details of career to Box 6325.

All replies will be handled by Director personally and will be treated confidentially.

### SENIOR ELECTRICAL ENGINEER

required for

#### NUCLEAR POWER GROUP

of

THE DE HAVILLAND ENGINE COMPANY LIMITED  
Stag Lane, Edgware, Middlesex

The successful applicant will be responsible for specifying electrical equipment for nuclear power projects and general technical supervision of work.

Preferred age group 28-35 years. H.N.C. or Degree in Electrical Engineering essential. Experience in light power engineering field and some knowledge of electronics an advantage.

Applications giving full details of age, qualifications and experience to:

#### THE PERSONNEL OFFICER

Member Company of the Hawker Siddeley Group

6413

### GLIKSTEN (WEST AFRICA) LTD. Carpenters Road, Stratford, London, E.15

**A**SSISTANT ENGINEER (Electrical) required for a permanent and pensionable appointment in GHANA. Candidates should be between 25 and 31 years of age, have served a recognised apprenticeship, preferably in factory electrical maintenance, and have in addition a minimum of three years' practical experience.

They should also possess at least an Ordinary National Certificate (Electrical).

Please write with full particulars to the Personnel Officer. 6386

### LARGE FIRM of ELECTRICAL CONTRACTORS

require first-class

### SITE ENGINEER

experienced in steelwork installation. Able to control large labour force and negotiate with clients' representatives. Attractive salary.

Write in confidence to  
Box 6327

**A**RMATURE winders urgently required in the London area, basic rate 5s. 8d. per hour plus substantial efficiency bonus.—Box 186.

**A**SSISTANT electrical engineer required by national newspaper. Age 23/28. Electrical apprenticeship and Higher National. Must be first-class electrical draughtsman. Good prospects.—Box 6314.

**B**EST & MAY Ltd., 345/347, Kennington Road, London, S.E.11, require an experienced order office man. One with sound experience on industrial electrical distribution. Salary commensurate with age and experience. Good hours, 5-day week. Progressive post in expanding business. 6301

**C**HIEF purchasing officer required. Experience in light engineering and electrical components, supervising stock control, essential. Age limit 50. Interesting work with excellent prospects. 5-day week. Write—Box 6379.

**C**ONTROL circuit engineer and estimator for automatic motor control gear; O.N.C. or H.N.C. desirable with previous experience; permanent and pensionable situation. Apply giving details of age, experience and present salary to—The Managing Director, British Klockner Switchgear Ltd., Chertsey, Surrey. 129

**E**LECTRIC motor repairs, small shop. London district, capable man required, fully experienced domestic and fractional h.p. motors, salary and share of profits.—Box 6362.

**D**Irector of small electrical manufacturing co. in W. Middx. wishes to appoint deputy. Must have enthusiasm and ability to direct the company from small beginnings on course of steady expansion. Engineering training, commercial experience and all aspects of light electrical manufacture essential, also ability to introduce new products and ideas. Commencing salary £1,000 to £1,250 according to qualifications, plus share profits.—Box 6411.

**D**RAUGHTSMAN/estimator required for London office of electrical engineering company. Experience of installation contracts desirable. Age under 30 years. Good prospects for keen and adaptable man. Five-day week, pension scheme, luncheon vouchers. Write giving particulars of experience to—The Sunderland Forge & Engineering Co. Ltd., Creechurh House, Creechurh Lane, London, E.C.3. 6302

**D**RAUGHTSMAN (junior) electro/mechanical; interesting situation with excellent prospects. Apply giving full details of age, experience and present salary to—The Managing Director, British Klockner Switchgear Ltd., Chertsey, Surrey. 130

**D**RAUGHTSMAN required by expanding electrical engineering company in Birmingham. Alert, experienced, production minded young man to join busy team in engineering department dealing with electrical transformers and special allied equipments of considerable variety and interest. Company moving shortly from central position to new works on south western boundary of city. State experience, qualifications, age and salary required.—Box 6361.

**E**LECTRICAL contractors require an experienced estimating engineer for their overseas department in London; applicants should have experience in all types of industrial contracts and should be capable of preparing complete detail estimates without supervision. Write in confidence to—Box 6412.

**E**LECTRICAL draughtsman to take charge of small drawing office in works situated North London manufacturing distribution switchboards and general installation equipment. As the appointment would involve some work on the board it would probably suit a younger man with several years' recent experience as designer/draughtsman, and who is looking for some added responsibility and an outlet for originality and initiative. Commencing salary not less than £900 p.a. with senior staff and pension benefits.—Box 6443.

**E**LECTRICAL engineer required by tin mining company in Thailand; must be fully qualified certificated electrical engineer and conversant with installation and maintenance of heavy plant. Commencing salary from £1,540 to £1,820 per annum according to qualifications and experience; marriage allowance £210 per annum; free furnished quarters and free medical attention provided; contracts of 3 years' duration with six months' leave on full pay and allowance between contracts; company pays for passages of employee and family; non-contributory pension scheme and contributory provident fund. Written applications with full particulars of age, education, qualifications and experience, married or single, and copies of testimonials, to—Box 018, c/o Walter Skinner Ltd., 20, Connaught Avenue, London, E.C.2. 6432

**E**NGINEER with knowledge of process timing and control equipment is required as sales representative for London and Home Counties area. Minimum qualification O.N.C. or equivalent. Reply with full details of qualifications, experience and salary required to—Box 7641.

**Situations Vacant (continued)**

**E**Lectrical engineer required for Glasgow office staff, age 23-28. Applicants (H.N.C. minimum) should have had experience in the manufacture of electrical machines. Progressive salary with non-contributory pension. Applications stating age, nationality, qualifications and experience to—British Engine Boiler & Electrical Insurance Co. Ltd., 98, West George Street, Glasgow, C.2. 6400

**E**Lectrical engineer-surveyor, aged 26-32, required by leading insurance company. The successful applicant will be required to reside in Sheffield and must hold a Higher National Certificate. Apprenticeship and experience in the maintenance, testing and repair of industrial electrical plant essential. Drawing office experience an advantage. Commencing salary £800 rising to £1,100. Non-contributory pension scheme and other staff benefits. Write Box 979, c/o Walter Skinner Ltd., 20, Cophall Avenue, London, E.C.2. 6375

**E**Lectrical engineering assistants. Two men with initiative required. Age 25 to 40, of good general education and up to H.N.C. technical standard. Duties to assist in planning extensions and modernisation of electrical plant from intake substations to production unit in a specialised branch of the steel industry in the Midlands. Drawing office experience and some knowledge of industrial electronics an advantage. Salary according to capabilities; four figures considered for the best man. Write in confidence details of training, experience, present duties, qualifications and salary required to Chief Electrical Engineer.—Box 6388.

**E**Lectrical wholesalers, London N.W.1 district, require experienced order/progress clerk. Good salary.—Tel. PAD. 2083. 6434

**E**LECTRICIANS urgently wanted. Contract

**E**work. Screwed barrel, underfloor heating, house wiring, factory installations. London rates paid.—L. J. Ive Ltd., 29, Ciarendon Road, Watford, Herts. 7637

**E**STIMATING/supervising engineer required for contractor's London office. Applicants should have experience in preparation of tenders and setting out of work from design stage to completion. Write stating age, experience, etc., and salary required to—Phoenix Electrical Co. (London) Ltd., Phoenix House, 16-18, Marshalsea Road, London, S.E.1. 6401

**E**STIMATOR required. Experience in either industrial lighting engineering or building contracts essential. Age limit 50. Interesting work with excellent prospects. Bonus scheme. 5-day week. Write—Box 6378.

**F**URNACE engineer, experienced design and sales, to join small company specialising in preheat and stress relieving. Vigorous, well-spoken type, prepared to travel U.K. extensively as well as personally assisting owner of business. Car provided. Large unfurnished flat available in desirable area. Future prospects excellent if hard working and full of ideas. State salary required.—Cooper Electroheat Ltd., 164, Lord Street, Southport. 6380

**I**NSPCTION electrical engineer required for London area. Applicants should be between 25 and 40 years of age with minimum qualification O.N.C. and with some inspection experience. Reply to Box 6390, giving essential data and salary required.

**I**NSPCTION engineer, electrical, required by North-East firm. Applicants should be between 25 and 40 years of age and be prepared to travel. Minimum qualification O.N.C. and preferably with some inspecting experience. Please reply to Box 6389, giving essential data and salary required.

**J**UNIOR electrical engineer required as assistant to the chief electrical engineer of a large modern steel works in the Midlands. The appointment carries responsibility for technical development under the general guidance of the chief electrical engineer and gives excellent opportunities for promotion. Candidates, preferably with experience in the heavy electrical field, should possess H.N.C. minimum or graduate standard qualifications. Write giving age, details of experience, qualifications and salary level expected, to—Box 6364.

**K**ENT COUNTY COUNCIL require an electrical engineering assistant at a salary not exceeding £1,145 a year. Applicants should have experience in the design of electrical installations in buildings. Scale and starting salary dependent on qualifications and experience. Further details and application forms from the County Architect, Springfield, Maidstone. Closing date 2nd November, 1960. 6433

**I**NSPECTION electrical engineer required for Manchester area. Applicants should be between 25 and 40 years of age with minimum qualification O.N.C. and with some inspection experience. Reply to Box 6391, giving essential data and salary required.

**R**EPRESENTATIVE fully experienced electrical wholesale trade, required by rapidly expanding company. Comprehensive connection essential in North Thames districts. Salary, commission and expenses. Car provided or allowance.—Box 6435.

**S**HIFT electrical foremen are required by Bowaters United Kingdom Pulp and Paper Mills Limited, Thames Division, Northfleet, Kent. Applicants should have served a recognised apprenticeship and hold the Ordinary National Certificate in Electrical Engineering. Experience should include power engineering as encountered in a factory installation, H.T. and M.V. distribution, A.C. and D.C. motors with their associated control systems. A contributory superannuation fund is operated by the company. Applications should be sent to the Chief Engineer at the above address giving full details of age, training and experience. 6374

**S**ITE measuring surveyor required for the measurement and evaluation of electrical installations. Applications in writing in the first instance stating age, experience and salary, etc., to—Frank N. Falkner & Partners, Chartered Quantity Surveyors, Windscale Works, Seascale, Cumberland. 6253

**S**TOREKEEPER required for progressive position. Knowledge of conduit fittings and switchgear.—Leslie Maynard Ltd., 306b, Fulham Road, London, S.W.10. 187

**S**UPERVISING engineer for electrical contractors' London office, able to prepare schemes and estimates and carry through to account stage. Progressive, pensionable situation. Write—W. J. Furse & Co. (London) Ltd., 22, Aile Street, London, E.1. 6295

**T**ECHNICAL representative required by leading electrical manufacturer, installation division. Must have had electrical training. Good connection amongst electrical contractors, users, etc., with knowledge of conduit, fittings, switchgear, lighting and trunking and cable. Berks. and Oxon district. Write giving full details to—Box 6392.

**V**ACANCIES for senior and junior sales engineers exist at a progressive manufacturer of transformers and kindred equipment in the Greater London area. Permanent employment with good salary and pension rights available to men of good appearance, connections and experience. Please apply to—Box 6328.

**APPOINTMENTS FILLED**

Dissatisfaction having so often been expressed that unsuccessful applicants are left in ignorance of the fact that the position applied for has been filled, may we suggest that Advertisers notify us to that effect when they have arrived at a decision? We will then insert a notice free of charge under this heading.

**SITUATIONS WANTED**

**E**Lectrical/mechanical engineer, 61, A.M.I.E.E., A.M.I.Mech.E., wide experience home and overseas, coal and oil-fired boilers, steam and oil engines, generators, switchgear, transmission, distribution, installations, refrigeration.—Box 7639.

**E**STIMATING and supervising engineer requires situation. 30 years' experience in commercial and industrial field. Willing to travel.—Box 7638.

**F**OREMAN electrician requires interesting, responsible and remunerative position; will travel.—Box 7629.

**I**NDIAN transformer design/draughtsman with experience requires permanent position.—Box 7632.

**P**RACTICAL electrical engineer requires position in Surrey with progressive company. First-class all-round experience with 25 years' extensive knowledge in the electrical industry. Also capable of controlling departmental staff.—Box 6393.

**ARTICLES FOR SALE****HOUSE SERVICE METERS**

**200**-240-v. A.C. or D.C., 10 amps. capacity, quarterly type, from 25s. each, plus 2s. 6d. carr.

**UNIVERSAL ELECTRICAL CO.**  
221, City Road, London, E.C.1

**600**

**1,200**-h.p. (two 600-h.p.) Variable Speed D.C. Motor, 500/1,600 r.p.m., 500 volts D.C., comprising two 600-h.p. common shaft D.C. motors, forced draught cooled, with accessories. Prepared to consider selling as two separate 600-h.p. machines. Hardly used.

Two 8/16-volt, 8,000-amp. Plating Equipments, each comprising moving coil voltage regulator, main step-down transformer and WESTINGHOUSE oil-immersed selenium rectifiers. Four units, 16 volts, 4,000 amps., at present arranged for fixed voltage operation. One 16-volt, 1,000-amp. unit for fixed voltage operation.

**GEORGE COHEN  
SONS & CO. LTD.**

Wood Lane, London, W.12  
(Shepherds Bush 2070)  
Stanley, Nr. Leeds  
(Pudsey 2241)

333

**ELECTRICAL PLANT FOR SALE**

**2** HICK HARGRAVES type RC14 Low-pressure Blowers, 1,010 cubic feet/min. at 600 r.p.m., each driven by MATHER & PLATT 125-b.h.p. motor, suitable for use on 3.3-kV supply. Blower serial numbers 2718 and 2719. Excellent condition.

**1** BRUSH Oil Circuit Breaker, cubicle type SK4, 11 kV, 40 amps., fitted with instantaneous relay type A.

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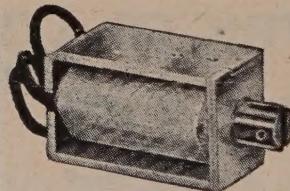
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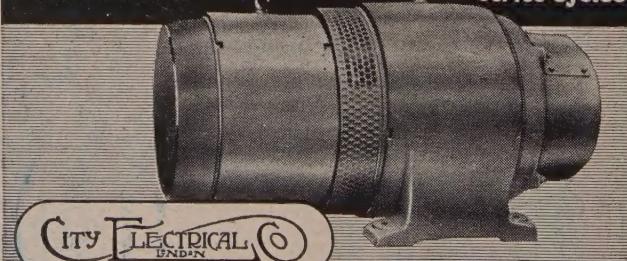
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